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THE
COMMENTARIES
UPON THE
APHORISMS

OF
Dr HERMAN BOERHAAVE,

The late Learned Professor of Physic in the
University of LEYDEN,

CONCERNING

The KNOWLEDGE and CURE of the several
DISEASES incident to HUMAN BODIES.

By GERARD VAN SWIETEN, M.D.

Translated into ENGLISH.

The SECOND EDITION.

VOL. V.

LONDON:

Printed for ROBERT HORSFIELD, in Ludgate-Street;

AND

THOMAS LONGMAN, in Pater-Noster-Row.

M DCC LXV.

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MDCCLXX

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COMMENTARIES
UPON THE
APHORISMS
OF
HERMAN BOERHAAVE,
CONCERNING THE
KNOWLEDGE and Cure of DISEASES.

Of Internal DISEASES, and of
FEVERS in general.

SECT. DLVIII.

WE are now to explain the nature of a fever, which is the most frequent of all diseases, an inseparable companion of inflammation, often the cause of numerous other disorders, and of death itself, though frequently it happily proves the cause of a recovery.

We have, in the preceding volumes, explained the most simple diseases of the solid parts, as also the disorders which happen from a spontaneous degeneration in the humours; we likewise completed the history of external or chirurgical disorders, whose causes and principal effects lie open to

the senses : We are now, therefore, to treat of internal diseases, whose causes are more concealed and difficult to be known, inasmuch as they frequently bury, or hide themselves from the sense, in the most internal or central parts of the human body ; and we are, likewise, to discover the causes and effects of these internal diseases, less obvious to the senses, which we can hardly do, but by an observation of the injured functions, and by a comparison of them with the like disorders happening in the external parts of the body.

Indeed, the great number and variety of these diseases occasions no small difficulty in determining with which disease one ought to begin, in laying down the history of those, which are internal ; but if to these internal diseases we apply the rules, which were before enumerated at § 16, the reason will be evident, why we are to treat first of fevers. For a more evident knowledge of the disease, a greater simplicity in its nature, and its easily admitting of a cure, are circumstances necessary or required in that disease ; the history of which ought to precede the rest, to advance our doctrine in a methodical or just order. : But, in the mean time, it must be confessed, that the nature of fevers is more than a little concealed from us, and that they frequently put on very different faces, nor are they always easily to be cured ; but then all these difficulties equally attend upon the other internal diseases. But the fourth rule, which was prescribed at § 16, agrees more with fevers than all the rest of internal diseases ; namely, inasmuch as a knowledge of these is necessary towards understanding the rest of diseases : For, a fever, as we shall soon make it appear, is the most frequent of all diseases, and is always a companion with every inflammatory disorder, and very frequently attends the other diseases which are not inflammatory ; whence it is evident

SECT. 558. OF FEVERS in general. 3

is evident that the history of fevers ought to precede the history of other internal diseases.

The term Fever is derived from the Latin *fer-
vor* heat, according to the opinion of most phy-
sicians; but others derive it (*à februantō*) from a
purification or cleansing. The first derivation is
more agreeable to the opinion of the antient phy-
sicians, who have pronounced heat to be the es-
sence of a fever; for *πυρρός* and *πυρεξίς*, which
signify a fiery heat, are words also commonly used
by the antient physicians to denote a fever; and
even Galen * observes, that a fever, when very vio-
lent, is by Hippocrates called (*πυρ*) fire. But the
latter derivation is more agreeable to many, be-
cause by a fever the body is frequently depurated.

The most frequent of diseases.] It will be de-
monstrated hereafter at § 586, that fevers arise
from causes extremely numerous, and very differ-
ent from each other; and it will be there likewise
evident, that no human prudence can so avoid all
the causes, as to enable a person to remain free
from a fever all his life-time. The defects of diet,
and the vicissitudes of air or weather, and, especi-
ally, when there is a sudden alteration in the air
from heat to cold, &c. with the more than usu-
ally violent exercises of the body, strong passions
of the mind, &c. frequently excite fevers, even
in the most healthy bodies. While the philo-
sopher, being content with a little, leads a frugal
life, and has, after many struggles, learnt to go-
vern his passions, he, indeed, avoids a great number
of the causes of fevers; but yet, being frequently
employed on books, and exhausted by continual
meditations, he too late repents the having brought
upon himself the causes, not only of fevers, but
likewise of many more of the most obstinate disea-
ses. Hence, we may almost venture to affirm,

B 2

that

* Comment. 13. in 1. Epidem. Charter. Tom. IX. pag. 102.

that no person can live without a fever, and that few die without it. For, if we except those, who perish by a violent death, and such as are so fortunate, as to be extinguished by mere old age without disease, which are indeed few, almost all the rest die, either of a fever, or of diseases which are accompanied with a fever. We read, in Pliny^b, with what fear and trembling the Romans endeavoured to have this universal disease, a fever, appeased by their supplications in the Temple of Fanum. And hence, perhaps, it is that fevers are called diseases by Hesiod^c, and that Horace^d calls all diseases simply fevers, when they tumbled out of the box of Pandora.

*Post ignem æthereæ domo
Subductum, Macies, & nova Febrium
Terris incubuit cohors.*

An inseparable companion of inflammation.] That a fever always attends in the most violent and inflammatory diseases, there is no one doubts. Thus it will appear hereafter, in the history of a pleurisy, that this inflammatory disorder is rarely observed without a fever preceding, but never without a fever attending. But when a slight inflammation only is seated in some external part of the body, one may then, with more reason, doubt, whether it is always accompanied with a fever. But if you peruse what has been said of inflammation in § 371, it will be sufficiently apparent, that a fever is deservedly pronounced an inseparable companion of inflammation, and that it is even a fever, which distinguisheth inflammation from obstruction. This was also the opinion of Hippocrates^e, who, endeavouring to demonstrate that
the

^b C. Plin. Secund. Hist. Nat. Lib. II. cap. 7. ^c Opera & Dies versu 102. ^d Lib. I. od. 3. ^e De Flatibus cap. 3. Charter. Tom. VI. p. 215.

Sect. 558. Of FEVERS in general. 5

the air is able to do much in producing all diseases, says; *Primum autem à communissimo morbo febre incipiam, ille enim morbus insidet* (ἐφειδρεύει) *omnibus aliis morbis præsertim verò inflammationi*; “ But I “ shall begin first with the most common disease, “ a fever, for that accompanies all other diseases, “ but more especially inflammation.”

Numerous diseases and death, &c.] Since in every fever the velocity of the motion of the circulating humours is increased, it is evident that all the disorders, which are observed to follow from that increased velocity, may result from a fever as the cause. But how bad, and how numerous these effects frequently are, has been made evident, in what was said by way of comment to § 100. But the truth of this will be still more evident, when we come to treat of the effects of a fever at § 587. For most of the acute diseases arise after a fever preceding, as will be made evident in the history of them: And again, all those acute diseases are more or less accompanied with a fever. But even chronical diseases owe their rise, in a great measure, to the disorders which have been left by acute diseases, not well cured, as we shall declare hereafter, at § 1050. Hence it will not seem wonderful, that fevers should be the causes of most diseases, and of death: But it may, perhaps, not appear so evidently to some, that a fever, itself a disease, should, nevertheless, frequently prove one of the best causes in curing diseases: And yet nothing is more true than this assertion, which is confirmed by most certain observations in all ages; from a great number of which observations it may be sufficient for us to relate a few. Hippocrates^f tells us, that an apoplexy may be cured, if the patient is seized with a fever; although he had before pronounced a profound apoplexy incurable, and a
flight

^f Aphor. 42. Sect. 2. Charter. Tom. IX. pag. 81.

6 Of FEVERS in general. Sect. 558.

slight one very difficult to remove²: And, in another place he says: *Si quis ebrius de repente obmutescat, convulsus moritur, nisi eum febris corripuerit, aut qua hora crapula solvitur, vocem edat*: “If
 “ a drunken person suddenly loses his speech, he
 “ dies convulsed, unless he should be taken with
 “ a fever, or recover his speech as soon as his
 “ drunken fit is over.” Hippocrates also³ acquaints us in several places, that convulsions, and even a tetanus, are often cured by a fever; *à convulsione si febris prehenderit, cessat eodem die, aut postero, aut etiam tertio¹ mulieri, ex partu convulsione infestata, febrim supervenire bonum. Tetano & convulsioni febrim supervenire bonum⁴*. “If the
 “ patient shall be seized with a fever after convulsions, they cease the same day, the day after, or
 “ at least on the third day: If a woman is taken
 “ with a fever, after being seized with convulsions
 “ from being delivered, it is a good sign. For a
 “ fever to come after a tetanus and convulsions is
 “ a good sign.” Hippocrates, likewise, in many places acquaints us, that a quartan ague is of very long continuance, but without danger, and a preventative to many other greater diseases. ¹ There are also many salutary effects of fevers recorded by Hippocrates in other diseases, a great part of which has been collected by Celsus, where he treats of those signs, which denote danger or recovery in any disease⁵, as follows. *Denique ipsa febris, quod maxime mirum videri potest, sepe præsidio est. Nam & præcordiorum dolores, si sine inflammatione sunt,*

² De morbis Lib. I. cap. 7. Charter. Tom. VII. pag. 558.

³ Aphor. 5. §. 5. Charter. Tom. IX. pag. 196. & De morbis Lib. I. cap. 7. Charter. Tom. VII. pag. 559. ¹ De locis in homine cap. 13. Charter. Tom. VII. pag. 372.

⁴ De morbis Lib. I. cap. 4. Charter. Tom. VII. pag. 535.

¹ Epidem. Lib. I. Charter. Tom. IX. pag. 88. & Epidem. Lib. VI. ibid. pag. 550. Aphor. 70. § 5. ibid. pag. 242.

⁵ Lib. II. cap. 8. pag. 79.

sunt, finit; & in jecinoris dolore succurrit; & nervorum distentionem, rigoremque, si postea caput, ex toto tollit; & ex difficultate urinae morbum tenuioris intestini ortum, si urinam per calorem movet, levat, &c.

“ Lastly, a fever itself (which may indeed “ seem very wonderful) is often a remedy; for it “ removes pains about the præcordia, if they are “ without inflammation; it likewise relieves the “ pain about the liver; and if convulsions or shiverings afterwards invade the patient, the fever “ removes them entirely; and a disorder of the “ smaller intestines, arising from a suppression of “ urine, is likewise relieved by a fever, if the urinary discharge is excited by the heat.”

A fever is, therefore, not always of pernicious consequence; and those are in an error, who believe that a fever is always to be reduced, or suppressed, by all the assistances of art; whereas nature frequently overcomes such diseases by a fever, as would otherwise remain inflexible to the best remedies. Sydenhamⁿ, therefore, who was a very happy observer of the footsteps of nature, in curing diseases, justly calls the fever an instrument of nature, by which she endeavours to separate and throw off the impure from the pure parts: And, in another place^o, he says, that the fever is excited by nature to discharge the foreign matter, which is injurious to herself, or else to change the blood into some new state. An example of the first effect of a fever he takes from that kind accompanied with eruptions, as happens in the small-pox and measles, &c. But the latter he demonstrates from people being taken with a fever, after they have undergone some great alteration in the use of the non-naturals, by which fever they are again enabled to sustain what they could not

B 4

well

ⁿ Sect. 1. cap. 4. pag. 72.
pag. 58.

^o In initio ejusdem capituli

8 Of FEVERS in general. Sect. 558.

well before support, without manifest detriment to their health. For we are taught, by repeated observations, that those who take long journeys into the most remote regions or foreign climates, after living there some time, are generally taken with a fever, though they were before in perfect health; and, by this fever, their bodies receive such an alteration, as enables them more easily to sustain the unusual air and diet of the place for the future.

Sydenham^P was, therefore, not solicitous to remove the fever, but only to observe carefully, whether the motion, excited by the fever, was so great, as to be usually followed with dangerous symptoms; or if, on the contrary, the motion was so languid, as to be unable to procure a separation of the morbid from the healthy parts of the humours, or to attenuate and alter the humours into a new state. But by this knowledge he quieted the salutary febrile motion, when it was too exorbitant, and increased it, when too languid: But, when the fever continued within its due bounds, he remained only a spectator, without making any alteration, supporting the patient's strength by a suitable regimen or diet, and waiting for the event, which, by the experience in his profession, he knew would be salutary. From hence it is, therefore, evident, that a fever ought sometimes, not only to be left to itself in the cure of diseases, but that sometimes also the fever is to be increased, agreeable to the rules of art. There is a very seasonable passage, in confirmation of this matter, given us by Hippocrates^Q, in his Coan prognosticks, *convulsionem solvit febris acuta superveniens, quæ prius non fuit, si vero fuit prius jam exacerbata*: "That an acute fever, coming after convulsions, and not appearing before, terminates the disorder; but if the fever
" was

^P In initio ejusdem capituli, pag. 61. ^Q N^o. 358. Charter. Tom. VIII. pag. 871.

“ was previous to the convulsions, the latter is then
“ increased.”

S E C T. DLIX.

THE nature of which disorder, being esteemed latent or concealed from us, we ought therefore, by all means, to be careful to avoid all error in searching out its nature.

It has been thought so difficult to know the nature of a fever, that it is almost become a proverb, that the wisest man nevertheless knows not the nature of a fever: For, if even the most skilful physician sees a person, who has had one or two fits of a regular quartan, but visits him in the interval betwixt the two fits, or even but half a quarter of an hour before the approach of a new fit, the physician will then discover no defect, either in the solid or fluid parts of the body, and often he will not be able to perceive any injury in the functions, though, in a few minutes after, the patient will be invaded with his fever. The greatest caution is, therefore, necessary in searching out the very latent nature of a fever. In this case we are not to assume any thing from hypotheses, previously contrived, however ingenious they may seem; but we are only to consider the appearances of the fever present in the body, and to weigh each of them apart, that, by afterwards comparing them together, we may, by just reasoning, be led from them to understand the proximate cause of a fever. While the most acute philosophers indulge their speculations, in searching after the causes of natural things, they often entertain us with splendid theories and wonderful products merely of imagination,
yet

yet without doing any great damage: But when this way is taken to discover the nature of diseases, the method of curing may be founded upon a false hypothesis, which would be turning into a pastime a matter of the greatest importance, and most serious consideration; namely, what relates to the life and health of ourselves, and the rest of mankind.

S E C T. DLX.

BUT in this case the great number of symptoms, with which a fever is usually attended, though it may likewise be without them, gives occasion for the physician to fall more easily into error or mistake.

If we look into what is said in the history of the symptoms of fevers, it will be evident, that there is no function in the body, but what has been sometimes observed to be injured during a fever. How often is the patient delirious in a fever, and yet have I sometimes known the wit to be sharper in each fit of an intermitting fever: Sometimes the fever is accompanied with a vomiting, nausea, loss of appetite, gripes, a diarrhoea, &c. and yet, on the contrary, at another time of the fever, there shall be an extreme hunger. Sometimes there are pains in various parts of the body, accompanied with a fever, and sometimes on the contrary, the pains are observed to cease, during the time of the fever, and return again, when the fever ends. This great number and variety of symptoms has led many into error, according as they have endeavoured to detect the nature of the fever, from only some of those symptoms, as they more or less favoured a preconceived hypothesis. But as the

2

majority

Sect. 560, 561. Of FEVERS in general. 11

majority of these symptoms vary almost in every febrile patient, as well as in the different species of the fevers themselves, it is sufficiently evident, that the nature of a fever cannot be discovered and known from those symptoms, which may be separated from the fever: And yet, from these have been derived a great diversity of opinions, concerning the cause and nature of fevers, and which have been often surprizingly set forth, even by physicians of the greatest eminence, to support and defend the opinion which they have once embraced. Both the patient and by-standers might justly laugh at a physician, who should deny that the patient has any fever, in the beginning of a fit of a quartan ague, where there is often a shivering for some hours: And yet Fernelius^r could not be brought to acknowledge, that the rigor or shivering, which happens in the beginning of an intermitting fever, should be reckoned a fever, since it was not conformable to the opinion of Galen, which he espoused; namely, that a fever was a præternatural heat, diffused from the heart throughout the body. These separable or accidental symptoms may, therefore, serve to distinguish the several different kinds of fevers; but we can only make use of those symptoms for discovering the individual nature of a fever, which always accompany every fever.

S E C T. DLXI.

TO avoid such error or mistake, therefore, it will be necessary for us to select only such symptoms or appearances (from that infinite variety § 560) as always attend every fever; and, by discovering the presence of
which

^r Pathol. Lib. IV. cap. 1. pag. 3.

12 Of FEVERS in general. Sect. 561, 562.

which symptoms, all physicians are taught, that a fever is present, and, by the absence of which, they all judge a person to be free from a fever.

How much soever physicians may differ among themselves about the causes and nature of fevers, yet all of them, who are skilled in diseases, are capable of distinguishing, whether a sick person has a fever or not. There are, therefore, some symptoms or appearances present in every fever, by which they are assured of its existence; and these will be present, as well in continual fevers as intermittents, as well in a salutary ephamera as in the most ardent fever: And these symptoms must also attend throughout the whole time of the fever, or else they may be fallacious. All the other symptoms, therefore, which attend only in some fevers, or only at certain times in fevers, are to be rejected, and those only retained, which occur at all times, and in every fever. By this means, we shall avoid the confusion arising from such a multiplicity of the febrile symptoms; and thus the whole matter of enquiry may be reduced to the greatest simplicity, as will soon be evident, from what follows.

S E C T. DLXII.

AND then from these symptoms (§ 561.) discovered, and rightly considered, we must thence search out the individual nature of a fever.

The celebrated author of these aphorisms is used to tell his audience, upon this occasion, that, by a tedious labour, he collected together, from a
great

Sect. 562, 563. Of FEVERS in general. 13

great number of authors, those symptoms which he had observed in fevers. He then blotted out from this catalogue all those which appeared not in all, but only in certain particular fevers, retaining such only which, by the common consent of authors, and his own particular observation, he found to be present in every fever; and then, from carefully considering these inseparable symptoms, and comparing them together, he endeavoured to discover the individual nature of a fever. But he was surprized to find, that this plain method reduced the matter of enquiry to so great a simplicity, which, at first, seemed to be so operose and difficult to be known; for out of the very numerous catalogue of febrile symptoms there remained only the few which next follow.

S E C T. DLXIII.

IN every fever, arising from internal causes, there is always a shivering, a quick pulse and heat, varying in degree at different times of the fever.

There are then only three symptoms or appearances, observed in common to all fevers, namely, a shivering, quick pulse and heat. The term *horripilatio* or shivering is used by physicians to signify that shaking of the whole body, which arises from a sense of cold; as when a person being warm suddenly exposes his body to a cold air; the Dutch people call it *Een buyvering*. This sense of cold is always observed to attend in every fever, which arises from internal causes. But, by an internal cause, we understand that producing the fever, which pre-existed in the body before the fever appeared, whether that cause was originally at first
without

14 Of FEVERS in general. Sect. 563.

without the body, and entered into it, or whether it was generated within the body itself. Thus, for example, the pestilential contagion, or that of the small-pox, &c. being taken into the body, excites a fever, but always with this shivering preceding, altho' the cause itself is not generated in the body, but conveyed into it from without. Thus also the bile, being corrupted by stagnation or any other cause, kindles a fever, which always begins likewise with such a shivering. But in both these cases, the fever is said to arise from an internal cause. But when a fever arises from an external cause, that is, from one which did not pre-exist in the body before the fever appeared, then this shivering is not always present; as for example, if a person falls into a fever, after being heated with sudden and severe anger, there is then no shivering perceived, but only a heat. The same is also true, when a most acute, and often suddenly fatal fever is excited, after most violent and long continued exercise of body; for then also there is no sense of coldness perceived; and, therefore, the reason is evident, why it is said in the text, that these three symptoms or appearances are present in every fever, arising from internal causes.

But the quickness of the pulse is measured by the excess of its celerity, beyond what it usually beat in the same person in health. For in different people there is a notable difference observed, in this respect, and the pulse of infants is generally observed (*cæteris paribus*) quicker than in adults. In an adult, healthy person, at rest, we generally number three pulses, in the space of two seconds of a minute, of which spaces there are 3600 contained in an hour: When, therefore, the artery beats oftener in this space of time, the pulse is said to be quicker. But the febrile heat is likewise measured by comparison with the heat of a person

in

Sect. 563. Of FEVERS in general. 15

in health; and this, either by the touch, or by the thermometer, which last discovers it with much more exactness.

But the three forementioned appearances are not observed together, throughout the whole course of a fever; for the shivering attends, when the fever begins, and is then followed by a heat, gradually increasing, and always the most intense (*ceteris paribus*) in the height of the fever, decreasing again afterwards by degrees with the fever itself. But sometimes, tho' rarely, this shivering, or chilliness, accompanies the fever throughout its whole course, or else the greatest part of it. Galen¹, speaking of the *febris epiala*, says, it is properly thus called, when the patient perceives a fever and chilliness together at the same time, in any part of the body; but, we must observe, that Galen understood the essence of a fever to be heat. The same, likewise, seems to have taken place in those fevers, which are, by Hippocrates², called *σπινώδες πυρετοὶ* horrid. For Galen³ observes, in his commentaries upon this place, that Hippocrates does not so call those fevers, in which there is a shivering observed in the beginning, but such as have the shivering extended through the greatest part of the whole fever; and he adds, that fevers are then said to be horrid, when the shiverings are distinguished from each other only by short intervals, or fits of intermission. But if the horrors return at large intervals, it is termed *anadiplosis*, or a reduplication, as is mostly observed in semitertians, where a new paroxysm comes on before the first fit is quite finished.

But the three forementioned appearances or symptoms differ in degree, according to the nature of

¹ De Febribus Lib. II. cap. 6. Charter. Tom. VII. pag. 132. ² Epidem. I. tex. 24. Charter. Tom. IX. pag. 25.

³ Ibidem.

16 Of FEVERS in general. Sect. 563, 564.

of the fever itself, with the different age, habit of the patient, &c. Thus a quartan frequently oppresses an old man, in the midst of winter, with so severe a cold in the beginning of the fit, that his whole body feels chilled like marble; and, on the contrary, if a tertian invades a strong young man in the spring, a slight cold or chilliness is usually followed with a very intense heat. In an *ephemera*, or simple fever of a day's continuance, there is a moderate heat; but in an ardent fever, an intolerable burning heat soon destroys the body; and in such a bad kind of fever, the extremities are often cold, while the patient perceives a burning within his body. We come now, therefore, to the general division of fevers, into acute and slow.

S E C T. DLXIV.

THE fever, in which the three fore-mentioned symptoms, or appearances, (§ 563) run on swiftly and with danger, is termed acute.

To denominate a fever acute, it is not sufficient only for the three forementioned symptoms, common in all fevers, to advance swiftly, but it is also required for life itself to be in danger, or at least there should be reason to fear it from such a fever: For no one will call a fever of one day acute, when it terminates in twenty-four hours time. For, as Celsus well observes, “such a kind of disease can
“ be neither termed acute, as it is not dangerous,
“ nor long, because by proper treatment it is easily cured.” *Neque acutum diei potest, quia non perimit; neque utique longum, quia, si occurritur facile sanatur.* Thus we may very well exclude such

* Lib. III. cap. 1. pag. 111.

Sect. 564. Of FEVERS in general. 17

such short and little or nothing dangerous diseases, from the general definition of acute fevers, which Celsus had a little before given in the same chapter, "namely, that they are short and severe, soon killing the patient, or soon terminating themselves;" and in the next chapter he adds, "that when the disease urges with acute pains, and without intermissions of the fits, it is acute." *Breves acutique sint, qui cito vel tollunt hominem, vel ipsi cito finiuntur* * *ubi sine intermissionibus accessiones, & dolores graves urgent, acutus morbus est.*

But it may be deservedly questioned, what are the limits of time, which the continuance of a fever ought not to exceed, in order to denominate it acute? Galen, and most authors after him, propose the twentieth day as the farthest limits of acute diseases; and as the majority of fevers terminate much sooner, he has, for the sake of method, made a farther sub-division of acute diseases, terming those peracute, which extend to the seventh day; yet he terms those exactly peracute which extend to the fourth day, and those not exactly peracute, which are continued to the seventh day: But when the disease exceeded the seventh day, and terminated within the twentieth, he calls it simply acute. And, again, those he makes exactly acute, which extended to the fourteenth day; but such as continued to the twentieth day, not exactly acute. Almost the like distinctions are made by Hippocrates † in his Prognostics.

But as every fever terminates in health, another disease, or in death, as we shall declare at § 591; if then the fever exceeds the space of twenty days without terminating in health or death, and without changing into any other disease, but runs

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on

* Cap. II. p. 113. † De diebus decretoriis Lib. II. cap. 12. Charter. Tom. VIII. pag. 489.

on in the same manner, and almost with the same symptoms, it would seem hard to call such a fever on the twenty-second day, long or slow, which, two or three days before, was reckoned among the acute, and still continues the very same disease, only running to a greater extent. In such a case, the antients have called them indeed acute fevers, not simply so (ἐκ μελαπλώσεως ὀξεία ^z) but extended. For ^a Galen had known many who had been afflicted with an acute continual fever, even to the fortieth day, who all that time never recovered their health; whence, he says, it is evident that such diseases cannot be termed slow or chronical; and yet they cannot be termed simply acute, agreeable to the received doctrine; and therefore such diseases are distinguished by him with the name afore-mentioned, that they might not be confused with acute diseases, properly so called. But when the fever terminated within that space of time, so as to be perfectly off and return again, then it was enumerated among diseases of long continuance. For it frequently happens, and several such cases are related by Hippocrates in his Epidemics, in which, when the disease has seemed to be terminated, it has, nevertheless, returned again; and such returns generally began upon some critical day, of which we shall speak hereafter, and again terminated on some other critical day. But since the intermediate days betwixt the imperfect removal of the disease, and its return again, were without any fever, therefore such diseases cannot be called acute and extended; therefore Galen ^b would have all these particular diseases or attacks termed acute; but the whole
 affem-

^z Charter. Tom. VIII. p. 664. ^a Galenus de diebus decretoriis Lib. II. cap. 12. Charter. Tom. VIII. p. 490. ^b Lib. II. de diebus decretoriis cap. 4. pag. 482, 483.

assemblage of them together he would have termed a disease of long continuance.

Perhaps, some may believe, that in the beginning of such diseases, there are certain signs to be discerned, from whence one may conclude whether they will terminate in the space of twenty days, or sooner, or whether they will run out beyond that time; and that therefore at the beginning one might determine whether the disease ought to be ranked among the acute, or those of long continuance. But Hippocrates has observed to us ^c, *per horum initia difficilior esse eos prænoscere, qui intra longissimum tempus judicari debeant, similia namque sunt illorum principia. Verum à primo die animadvertendum est, & ad quemque quaternarium additum considerandum, nec latebit, quo se versurus sit moribus.* “ That in the beginning of these diseases, it is more difficult to know which of them will terminate in the longest time, because the appearances of them are alike. But that one’s observation ought to be begun from the first day, and an enquiry made upon every fourth day from, or added to the first, whence it will not be concealed from the physician how long the disease is about to extend itself.” Hippocrates also seems, in his Prognostics, to extend the limits of acute diseases to the space of sixty days, which he also remarks in another place, where he says, ^d *Judicantur autem febres quarto die, septimo, undecimo, decimo quarto, decimo septimo, uno & vigesimo. Ex his vero acutis trigesimo, dein quadragesimo, postea sexagesimo. Quum vero hos numeros exceßerint, diuturna jam evadit febrium constitutio;* “ But fevers are terminated on the fourth, seventh, eleventh, fourteenth, seventeenth, and

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twenty-

^c In Prognosticis Charter. Tom. VIII. pag. 665 ^d In fine libri de diebus criticis. Charter. Tom. VIII. pag. 376.

20 Of FEVERS in general. Sect. 564, 565.

“ twenty-first day. But out of these the acute
“ terminate on the thirtieth, others on the forti-
“ eth, and others again on the sixtieth ; but when
“ fevers have exceeded those numbers, the consti-
“ tution of them becomes slow, or of long conti-
“ nuance.”

But all these particulars ought to be understood only of those fevers which continue the same disposition, notwithstanding they are extended to such a length. For acute diseases, after having run through their course, frequently terminate neither in health nor death, but in some other disease, which disease, though resulting from an acute one, is, nevertheless, justly termed long. Thus an empyema and phthisis sometimes arise from a pleurisy coming to suppuration, and which are dangerous cases, though they do not terminate speedily, but kill by a slow death, or else are cured, but with difficulty, and after a long time. But in what manner fevers often terminate in other diseases, we shall explain hereafter at § 593.

S E C T. DLXV.

BUT when those inseparable symptoms of a fever advance slowly, with or without danger, the fever is said to be slow.

From what has been said in the comment to the preceding aphorism, it is sufficiently apparent what fevers ought to be termed slow, namely, such as do not exceed the space of time there limited ; but, to denominate a fever acute, it is required that its swift course be joined with danger ; but, in order to denominate a fever slow, the small advance which it makes is sufficient, whether life be in danger

Sect. 565, 566. Of FEVERS in general. 21
ger or not. For a quartan hardly ever proves fatal, unless by some error in the patient or physician, and ought therefore to be ranked among diseases of a long continuance, as well as a hectic fever, from whence very few escape. Therefore Celsus very well defines diseases of long continuance to be those, * *Sub quibus neque sanitas in propinquo, neque exitium est*; "In which neither health nor death are near at hand."

S E C T. DLXVI.

BUT both acute and slow fevers (§ 564, 565.) are either epidemical in common to a whole people, or else peculiar to this or that person.

We come now to another division of fevers, to which both acute and slow ones are equally subject, namely, that all fevers are either epidemical, invading a great many people in the same country or place, though of different temperatures, and various in their way of living; or else they are peculiar to this or that individual person, and are called sporadic. The origin of epidemic fevers, is always from some cause in common to the whole people who inhabit any particular place; as for example, when in besieged cities the scantiness of the market obliges all to use an ill course of diet, or when the cause which popularly spreads the fever lies concealed, of both which we have had many instances. But sporadic, or particular fevers differ with respect to their original causes, almost in every individual person, according to the particular habit, way of life, or preceding diseases. Since epidemi-

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* Lib. III. cap. 1. pag. 111.

22 Of FEVERS in general. Sect. 566.

cal fevers arise from some common cause, they have usually almost the same course and symptoms, and require the same method of cure in all: but particular fevers, arising from very different, and often opposite causes, require to be treated in a different manner in various people. But this division of fevers was made long ago by Hippocrates, who says, *Februm autem duo sunt genera, unum quidem omnibus commune; pestis λοιμος appellatur, alterum vero ob pravam dietam privatam prava dieta utentibus contingens*; “ But there are two kinds of “ fevers, one common to all people, called the “ plague, but the other, arising from a bad diet, “ happens peculiarly to those who make use of such “ a diet ” But it is sufficiently evident from what follows in the same chapter, that by the word λοιμος Hippocrates did not understand the plague, properly so called, but only a fever common to many people living together in the same place.

But we much more frequently meet with acute fevers epidemical; and slow fevers more rarely, among which last quartans are the chief. But it also appears from the observations of Hippocrates¹, that certain dispositions of the air favour the rise of chronical diseases; for he remarks, that after a year has been attended with a mild and moist southerly wind, many have become tabid or consumptive; and in another place², he says, that at such times a great many of those who have lain a great while under an imperfect wasting, have been laid up with a perfect tabes. Also in many who doubted whether they were consumptive, the tabes has been confirmed; and those who have been naturally inclined to this disease, have, after such a season, been

¹ De Flatibus cap. 3. Charter. Tom. VI. pag. 215. ² Epidem. 3. Charter. Tom. IX. pag. 263.
Charter. Tom. IX. pag. 22--25; ³ Epidem. 1.

Se&t. 566, 567. Of FEVERS in general. 23
been first invaded with a consumption. He likewise adds, that then such as were taken with a consumption, perished sooner than they usually do in that disease.

S E C T. DLXVII.

THOSE are called acute febrile disorders, which are accompanied with the fever before mentioned (§ 564.) as those are called chronical, febrile cases, which are attended with that kind of fever at § 565.

Since all inflammatory diseases, and many others, are accompanied with a fever, as was said before, at § 558, therefore the history of fevers, taken in its greatest latitude, would include the greatest part of diseases, from whence great confusion would arise. For since, in inflammatory diseases, a various event is foreseen, and a different method of cure required, according to the particular part affected, it is thence evident, that the history of all those diseases ought to be delivered apart, though each of them are accompanied with a fever. These are, indeed, justly called febrile diseases; though, besides the symptoms in common to all fevers, § 563, they are also accompanied with others, deserving a particular regard, and arising, not from the fever, but from the part affected. Galen¹ has very well observed this, where he says, *Febris vexari Veteres dicebant ægros, qui absque aliqua inflammatione, vel abscessu, aut dolore, aut erysipelate, aut, simpliciter loquendo, absque aliqua parte præcipue affecta, male habebant. Si vero vel propter la-*
C 4 *teris,*

¹ Commentar. in Aphor. 73. Se&t. IV. Charter. Tom. IX. pag. 184.

teris, vel pulmonis, aut alterius cujusdam similis, inflammationem febricitarent, non vocabant illos febricitantes, neque febribus vexatos, sed pleuriticos, peripneumonicos, hepaticos, splenicos, &c. “The antients pronounce those patients afflicted with a fever, who find themselves ill without any inflammation, abscess, pain, erysipelas, or, simply speaking, without any particular part affected. But if they are afflicted with a fever on account of some inflammation in the side of the lungs, or some such other part, they did not denominate such to be in a fever, but termed them pleuritic, peripneumonic, hepatic, splenic, &c.” namely, they derived the name of the disease from the part chiefly affected by the fever; and the same method or order was required in our system.

In the same manner as a fever was lately said to be acute, when accompanied with danger, and taking a swift course; so acute febrile disorders are those accompanied with such a fever. But, generally, though not always, every acute disease is joined with such a fever. Thus Sydenham^k observes, that, during the first months in which the plague raged at London, there was every day people dropt down dead suddenly in the streets, when they did not, in the least, expect any thing ill from the contagion, which was blown to them; but that, when the disease grew older, no body died in this manner without being first taken ill with a fever, and other concomitant symptoms.

But when diseases, slow in their own nature, are also accompanied with a slow fever, they are said to be febrile or inflammatory, as well as chronical, as we observe in the worst species of the scurvý, an inveterate dropsy, consumption, and the like,

S E C T,

^k Pag. 224, Sect. IV. cap. 2,

S E C T. DLXVIII.

HENCE it is evident, that the explanation of all those, both acute and chronical febrile disorders (§ 567.) is founded upon the previous knowledge of the nature of a fever.

The history of a fever ought, therefore, to be premised, before we can speak in order of other diseases, as may be observed more at large in the commentaries to § 558.

S E C T. DLXIX.

WHICH knowledge is to be derived from a consideration of the three common symptoms (§ 563.)

There is only this one way of discovering the nature of diseases, namely, by considering each of the symptoms or appearances of the disease by itself, rather than by comparing them with each other, and with what usually happens in a state of health, and from thence, by just reason, to discover the proximate cause of the disease; see § 13. But here great care should be taken not to intermix any præconceived hypothesis; for how egregiously have those frequently erred, who, neglecting experience, or the observation of phænomena, have endeavoured to discover the causes of natural things by reasoning only. For, as the incomparable Sydenham¹ prudently observes, in detecting the nature of diseases;

¹ Dissertatio Epistolar. pag. 485.

26 Of FEVERS in general. Sect. 568, 569.

eases; *Si mentem serio applicuerimus, quid de facto agat natura, & quibus in operatione sua utatur organis, deprehendere valemus; modus tamen, quo illa operatur, aut ego fallor, semper latebit.* “ If we

“ seriously attend to what nature actually performs, “ and observe what instruments she uses in her “ work, we may be able to discover her operations; but the manner in which she operates, if “ I am not mistaken, will always be concealed.”

For thus, by a constant observation, we discover in every fever, that the velocity of the pulse is increased, and that therefore the heart contracts more frequently or swiftly; and thence again, that those causes, from whence the contraction of the heart results, are increased: but in what manner those causes act, which excite the heart to a quicker contraction, and after what manner, for example, an intermitting tertian is renewed every other day, when it afforded no action or appearances at all on the intermediate day; these are hitherto concealed from all of us. For all that we know of the nature of a fever, we discover only by its inseparable effects and appearances; nor has any one hitherto succeeded according to their wish, who have endeavoured to know more. Therefore the three common, or inseparable symptoms (§ 563.) are to be considered in order to discover the nature of a fever.

S E C T. DLXX.

TH E S E symptoms, indeed, (§ 563.) attend in every fever; but then only the quick pulse is present throughout the whole time of the fever, from the beginning to the end, and by that only the physician judges a fever is present.

The three mentioned symptoms or appearances, a shivering, quick pulse, and heat, are always present in every fever, arising from internal causes, as we said more at large in the commentaries to § 563. But, of these three, only the quick pulse is always present, from the beginning to the end of the fever; for neither the shivering, or cold chill, nor heat, are observed throughout the whole time of the fever. In the greatest cold of a quartan there is a fever; and even when a weak, old person is, in a manner, suffocated with a quartan in the midst of winter, as hath been sometimes observed before the hot fit, he will, notwithstanding, be said, by every one, to be dead during the febrile paroxysm; and, therefore, a fever is present, though no heat is observed. Those seem to trifle, indeed, who say, that a heat attends during the time of the febrile cold or chill, only that the heat is latent, and cannot be perceived. On the other hand, the heat sometimes precedes, and is followed by the cold chill, and, therefore, the person is in a fever, although no shivering be then present. The quick pulse is therefore the only symptom or appearance which always attends, not only in every fever, but also throughout the whole time of the fever. We may, therefore,
safely

safely appeal to all skilful physicians, whether they know how to distinguish a fever by any other sign? Certain we are, that no sign of fever remains, when, after the febrile cold, the heat gradually decreases to that of a healthy person, except only the increased quickness of the pulse.

Galen ^m, with the rest of the Greek and Arabian physicians, places the essence of a fever “ in a preternatural heat, largely diffused throughout the whole animal, or, at least, kindled throughout the greater part, or through the most noble parts :” *In caliditate præter naturam, maxime quidem in totum animal effusa ; sin minus, at omnino vel in pluribus partibus, vel in nobilissimis accensa.* And, in the same place, he condemns the opinion of Erasistratus and Chrysippus, who would have the essence of a fever consist in the motion of the arteries. But, in the same place, Galen observes, that although the whole skin sometimes affords no sign of preternatural heat neither to the physician’s touch, nor to the patient himself, yet, at the same time, there is a heat perceived within the body, and the viscera seem to be burnt up ; and thus he endeavours to prove that a preternatural heat attends every fever, and constitutes the essence thereof. This is indeed true in fevers of the worst kind, where the patient perceives a burning heat in the internal parts, and especially in the vital organs, although the extremities of the body are at the same time hardly warm, or even perfectly cold. But in the fit of a quartan or tertian, the patient perceives a most severe cold, though there is no increased heat perceived internally at that time, but both external and internal parts are equally sensible of a coldness. Hence it is evident, that a fever

^m Comment. 1. in Lib. VI. Epidem. ad text. 29. Charter. Tom. IX. pag. 382, 383. & alibi pluribus in locis.

Sect. 570, 571. Of FEVERS in general. 29
fever may exist without a preternatural heat, and
that therefore its essence does not consist in an in-
creased heat.

I believe it will be therefore apparent, to every
one who considers what has been said, that there
is but one essential sign of a fever being present,
namely, a too quick pulse : and thus, at the same
time, it will also appear, that the essence of a fever,
which, at first, seemed intricate, may be reduced
to the greatest simplicity by just reasoning, and se-
parating all those symptoms or appearances from
the fever, which only attend at some certain times,
and which may be separated from the fever. For,
in this place, we treat of the generical or simple
idea of a fever, which agrees with every fever of
what kind soever ; for the rest of the symptoms or
appearances, as was demonstrated before, are either
not present throughout the whole time of the fever,
or else serve to distinguish the several species of
fevers, but not at all to constitute what is properly
called the essence of a fever.

S E C T. DLXXI.

AND, therefore, whatever the physi-
cian knows of a fever, is entirely de-
rived only from the quickness of the pulse ;
but, after death, every fever ceases.

That an increased velocity of the pulse only,
should be taken for an infallible and pathognomonic
sign of a fever, has, for its simplicity, been thought
much of, and proved displeasing to many ; and
this, more especially, as the quickness of the pulse
is observed to increase by such slight causes, as
produce little or no disturbance throughout the
rest

rest of the body. This has been well observed by Celsusⁿ, where he treats of the time when febrile patients ought to take solid or fluid aliment, and concludes, that a remission or cessation of the fever are most convenient for this purpose, and that the whole difficulty consists in rightly knowing this. *Venis enim maximè credimus, fallacissimæ rei; quia sæpe istæ lentiores celerioresque sunt, & ætate & sexu, & corporum natura. Et plerumque satis sano corpore, si stomachus infirmus est, nonnunquam etiam incipiente febre, subeunt & quiescunt: ut imbecillus ille videri possit, cui facile laturo gravis instat accessio. Contra sæpe eas concitat & resolvit sol, & balneum, & exercitatio, & metus, & ira, & quilibet animi affectus. Adeo ut, cum primum Medicus venit, sollicitudo ægri dubitantis, quomodo ille se habere videatur, eas moveat. Ob quam causam periti Medici est, non protinus ut venit, apprehendere manu brachium, sed primum residere bilari vultu, percunctarique, quemadmodum se habeat, & si quis ejus metus est, eum probabili sermone lenire, tum deinde ejus carpo manum admovere. Quas autem venas conspectus Medici movet, quam facile mille res turbant!* “ Indeed we rely much upon the pulse, “ when it is a thing extremely fallacious, because “ the arteries are often quicker or slower, according to the age, sex, and habit of body. “ And, for the most part, if the stomach is out “ of order, though the rest of the body be well “ enough in health, the pulse will be increased “ and intermit, as sometimes in the beginning of “ a fever; so that thence a patient may easily seem “ weak, who is about to be taken with a severe “ paroxysm or increase of the fever. On the other “ hand, the heat of the sun, warm bathing, exercise, fear, anger, and other passions of the “ mind,

ⁿ Lib. III. cap. vi. pag. 129.

“ mind, frequently raise or depress the arteries;
 “ so that when a physician comes first to a patient,
 “ he may be under a doubt with respect to the ap-
 “ parent state and motion of the pulse from the
 “ patient’s surprise. For this reason it is the cus-
 “ tom of a skilful physician, not immediately to
 “ lay hold of the patient’s arm with his hand, as
 “ soon as he comes in, to feel the pulse, but to
 “ sit down a while first with a chearful countenance,
 “ and to enquire how he finds himself, and if he
 “ appears afraid or dejected, to encourage him
 “ with some good words, and then to apply his
 “ fingers to the wrist, in order to examine the
 “ pulse. But how easily may a thousand things
 “ disturb those arteries which are influenced by
 “ the approach or sight of the physician !” But, in
 another place°, treating of the time when nour-
 ishment ought to be given to febrile patients, he
 seems to attend principally to the quickness of the
 pulse, and, from that alone, to judge whether the
 fever was absent or not. For, he says, *Illud enim
 magis ad rem pertinent, scire, cibumne oporteat dari,
 cum jam bene venæ conquieverunt, aut etiamnum
 manentibus reliquiis febris.* “ For it is one of the
 “ most material points, to know whether aliment
 “ ought to be given, when the arteries are
 “ well composed or quieted, or whether it should
 “ be given while the remains of the fever continue
 “ upon the patient.”

But, even those, who following the opinion of
 the ancients, place the essence of a fever in the pre-
 ternatural heat, are embarrassed with the same
 difficulties; for, upon heat also, Celsus^p made
 the following remarks; *Altera res est, cui credimus,
 calor, æque fallax. Nam hic quoque excitatur æstu,*
 la-

° Lib. III. cap. 4. pag. 122.
 pag. 129.

^p Lib. III. cap. 6.

labore, somno, metu, sollicitudine. “ The other
 “ sign, heat, upon which we rely, is equally fal-
 “ lacious; for this is also increased by the heat
 “ of the weather, labour, sleep, fear, cares, &c.
 But it was not in the power of Celsus to give us
 more certain signs, whereby to distinguish the pre-
 sence or absence of a fever: and, a little after, he
 subjoins; *Ac protinus quidem scire, non febricitare*
eum, cujus venæ naturaliter ordinatæ sunt, teporque
talis est, qualis sanis esse solet: “ That one may,
 “ indeed, immediately know he is not in a fe-
 “ ver, whose arteries beat naturally; and whose
 “ heat is such as it usually is in health:” And yet,
 he would not have us conceive, that a fever attends
 merely from heat and motion, unless there are also
 other signs of the functions injured, which he af-
 terwards enumerates: but then, as we have often
 said before, these other signs do not make the ef-
 fect of the fever, but are only accidental compa-
 nions of it.

This has been, therefore, the principal difficul-
 ty, which has hindered many from admitting this,
 so simple idea of a fever, namely, because the mo-
 tion of the artery is accelerated by increased exer-
 cise, passions of the mind, very full diet, and the
 like causes slight enough in themselves: whence it
 would follow, that a person ought, in this case, to
 be reckoned in a fever, when, at the same time,
 every one will say, he is well. Certain it is, that
 a true fever attends in these cases, which vanishes
 immediately upon the cessation of those slighter
 causes; but those very same causes being more vio-
 lent, or longer continued and applied to the body,
 may excite the most dangerous fevers. Does it
 not appear, from frequent observation, that the most
 ardent fevers have arose from too violent exercises
 of body? And thus, also, gluttony has often
 raised

raised a dangerous fever, and many, by excess of wine, have perished apoplectic with an acute fever, as we are taught from medical history. It is not therefore in the least disagreeable to reason, that a slight and momentary fever should be excited from slight causes, in the same manner as the most acute fevers are often raised by the same, but more violent causes. Every fever which terminates within the space of twenty-four hours, without returning again, is, by the general consent of physicians, termed an ephamera; and this generally arises from some slight error in diet. But if such a fever terminates its course within the space of two hours, it is, nevertheless, called a fever: and therefore what should hinder us from calling the same disease a fever, if it continues only a quarter of an hour, or even a shorter space of time? I believe, that to one who carefully considers all these particulars, there will not appear any thing absurd in the general definition of a fever, which is taken only from the quickness of the pulse; since such a definition ought to comprehend, as well the least as the greatest fever, as a genus includes all the species.

But whereas this difficulty was opposed to the opinion of the antients, concerning the nature of a fever, in order to avoid it, Galen^a says, *Februm esse, cum adeo immoderate auctus color est, ut & hominem offendat, & actionem laedat: quod si neutrum adhuc efficiat, quantumvis si homo nunc quam ante calidior, non tamen fabricitare eum monstravimus.* “ That a fever is when the heat is so

“ immoderately increased, as to injure the person
 “ and his faculties or actions; but if it has nei-
 “ ther of these effects, though the person may be

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“ now

^a Method. med. Lib. VIII. Cap. 1 Charter. Tom. X. pag. 179.

“ now hotter than before; yet, we have demonstrated, that he is not in a fever.” This kind of reasoning has been handed down to us out of Galen, by the other Greek and Arabian physicians, who have wrote after him, according to their usual custom of copying him almost in every thing; but among these, Avicenna^r secludes, by express words, a heat arising from anger or exercise, when he says: *Febris est calor extraneus accensus in corde, & procedens ab eo, mediantibus spiritu & sanguine, per arterias & venas in totum corpus: & inflammatur in eo inflammatione, quæ nocet operationibus naturalibus, non sicut caliditas iræ & laboris, &c.* “ That a fever is an extraneous heat, kindled in the heart, and proceeding from thence by means of the spirits and blood by the arteries and veins throughout the whole body, which becomes inflamed in this inflammation, so as to hurt its natural actions or operations, which does not happen in the heat arising from anger, exercise, &c.”

Hence again, it has been the opinion of some, that a fever might be better defined by an increased velocity of the pulse, with an injury of the functions.

But, as various functions are injured in different fevers, it is again evident, that the quickness of the pulse only can define a fever in general, and that the functions injured may distinguish the several kinds of fevers. Nor is it any objection to this definition, that every disease supposes some function injured; (see §. 1.) and that therefore the same may be supposed in a fever, as that is a disease: for in reality the increased velocity of the pulse itself, is an injury of the heart's action; and therefore it is evident, that a fever may, by this great simplicity of its nature, be comprehended under

under the general definition of a disease, and that, strictly speaking, it never attends without injuring, at least, some one of the functions:

Moreover, that ought to be termed the chief, individual, and pathognomonic sign of a disease, which, being present, the disease itself must be allowed by every one to be also present, and which, being absent, the disease will be also absent: but, among the three signs common to all fevers (§. 563.) namely, the shivering, or cold chill, quick pulse, and increased heat, there is none but the quickness of the pulse which continues throughout the whole course of the fever, even till it terminates in death, and the body gradually grows cold; though sometimes, but rarely, a somewhat intense heat remains a considerable time after. Thus I saw a young man, who, being delirious in the confluent kind of small-pox, suddenly expired on the eleventh day, and there was a very considerable heat in the extreme parts of his body, even two hours after death. It was also observed, upon another occasion, (under §. 85.) that the body of an infant, dead of the plague, continued warm even on the second day after it expired.

To this it may perhaps be objected, that we very rarely meet with any mention of the pulse in fevers, throughout the works of Hippocrates; when at the same time, according to what has been before advanced, a fever can be only known by the quickness of the pulse. Galen* has recorded Hippocrates to have been the first that he knew, who had committed the name of pulses to writing, and that he could not seem to be ignorant of the art which he mentioned; and yet he observes to us, that Hippocrates did not make any great profici-

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ency

* De pulsuum differentiis Lib. I. cap. 2. Tom. VIII. pag. 15.

ency in this branch of the art, and that he did not attribute this name to the motion of every artery. But in the mean time it is evident, from several passages in Hippocrates, that he examined the pulse in sick people, and that he judged of the violence of a fever by the pulse. Thus, in his Coan Prognostics^c, he says, *Lethargicorum pulsus tardos esse*. "That the pulsations in lethargic patients are "slow." And, in another place^d that he found, *In Zoilo fabro pulsus tremulos tardos*. "The pulsations flow and trembling in Zoilus the workman. *In Polycrate febris adeo lenis erat, at obscure, præterquam in temporibus, consisteret*". "That in Polycrates the fever was so gentle, that "the pulse seemed obscurely to stand still, except "in the temples." And in another place, again he observes, *In acutissimis febribus pulsus maximos & densissimos esse*. "That in the most acute fevers, "the pulsations are the largest and hardest^e." Many other passages might be produced out of Hippocrates, from whence it is evident, that he observed the pulse: but, I think, those here mentioned are sufficient.

^c No. 140. Charter. Tom. VIII. pag. 859.

dem. Lib. IV. Charter. Tom. IX. pag. 320.

dem. Lib. VII. text. 2. Charter. Tom. IX. pag. 552, 553.

^e Epidem. Lib. IV. Charter. Tom IX. p. 518.

^d Epi-

^e Epi-

S E C T. DLXXII.

THE proximate cause therefore of the velocity or quickness of the pulse (§ 571.) is likewise the proximate cause of the fever thus known.

Since it has been abundantly proved, as I think, that the nature of a fever consists in the quickness of the pulse, it is therefore evident, that every thing which can produce the velocity of the pulse, as a cause, may be also the cause producing the fever. For the proximate cause of a disease, as we have observed in the comment to § 11. is that whose presence makes the disease; and whose absence removes it.

S E C T. DLXXIII.

THIS cause is therefore a quicker contraction of the heart. And therefore it is an affection of life, endeavouring to avoid death, as well in the cold chill, as in the heat of the fever.

Since Harvey has taught us that the blood contained in the cavities of the heart, is by the contraction of that muscle drove through the arteries, and returned into it again through the veins, to be sent from it, as before, through the arteries, so long as life continues; there is no one, I believe, doubts, that the dilatation of an artery which is perceived in the pulse, is made by the contraction of the heart. For when the heart is contracted, the valves
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being raised with a wonderful artifice (as explained at § 165 to 182, of the Institutions of our celebrated author) shut the venal orifices of the heart; whereupon all the blood contained in the cavities of the heart is expressed by the open orifices into the arteries, which are always full and converging. From hence necessarily follows a dilatation of the arteries, as they are flexible canals; and the moment after this, while the heart ceases to contract, the dilated arteries, by their own elasticity and action of their muscular fibres, are contracted, until they are again dilated by the repeated action of the heart. But during that moment of time that the artery is dilated by the blood impelled by the heart, the artery strikes against the finger, which is called the pulse; and therefore the artery beats as often as it is dilated. Since therefore the dilatation of the artery is contemporary with the contraction of the heart, the pulse cannot be accelerated without the contraction of the heart becomes quicker at the same time, as that is the only and entire cause of the dilatation of the arteries. For all that has been said by some authors concerning ebullition, fermentation, of effervescence of the blood, &c. in the cavities of the heart, has been proved to be false, and directly contrary to experiments⁷; and it appears, with the greatest certainty, that the cause propelling the blood from the heart into the arteries, does not reside in the blood itself, but in the heart, which immediately receives the blood.

A fever may therefore be deservedly called a disease of the heart, since in every fever the action of that muscular organ is changed, namely, by being brought into more frequent or quicker contractions. Even the antient physicians, though ignorant of the

⁷ Vide Institutiones Medicæ Boerhaavii §. 165. ad 182.

the circulation of the blood, were yet of opinion, that the heat, which they supposed to constitute the nature of a fever, was kindled in the heart itself. Thus Galen^z tells us, *Febris existit, quum calor quidem præter naturam in corde generatur.* "That a fever exists when a preternatural heat is generated in the heart" In a fever, therefore, life is attacked in its very spring or fountain, the heart itself: for so long as the venal blood continues to be received into the cavities of the heart, and to be expelled from thence by its muscular force into the arteries, life is said to be present; but when that action of the heart ceases, life departs, and the animal dies. But to continue this action of the heart, requires that all the blood contained in its cavities be, in each contraction, expelled into the arteries; for if the heart retained the least portion of blood at each systole, (since it contracts at least four thousand times within the space of an hour, in a healthy person) it would in a little time be filled up, and its motion suppressed; that is to say, death must follow; but, for the heart to expel its contained blood into the arteries, requires these last to dilate and transmit the blood, which they formerly received from the heart, through their smallest extremities: every thing therefore which impedes the motion of the blood through the arteries, disposes to death; that is, to stop the heart, whether it be from any defect in the contained blood, or in the contained vessels. Now it is observed, that the motion of the heart becomes quicker, as soon as ever there are such obstacles impeding the free expulsion of the blood from the heart. Thus a person who is suddenly affrighted, looks all over pale, and at the same

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^z De different. febr. Lib. I. cap. 3. Charter. Tom. VII. pag. 109.

time, the heart immediately palpitates very swiftly, because the veins being contracted, urge the blood more swiftly towards the heart, and the arteries being contracted or lessened, make a greater resistance to the blood to be expelled out of the heart. In the dissection of living animals, the heart moves so much quicker in proportion as death is nearer; and hence, in those last struggles which happen betwixt life and death, the contractions of the heart are observed to be so quick that no body can number them. It is therefore evident, that the motion of the heart becomes accelerated, whenever there is danger of death by stopping its motion; for the machine of our bodies is observed to be so formed, as to use the greatest endeavours to remove these obstacles, till being overcome by the impediments, the machine does at last rest. Since therefore in every fever the motion of the heart is accelerated, it is here justly said to be an affection of life, endeavouring to avoid death. The truth of this is most apparent in the cold fit of a fever, in which the coldness of the extremities manifestly denotes that the blood cannot be propelled to the ultimate branches of the arteries; and therefore there are obstacles in this case, which were not before. But, at that time, the pulse is observed to be quick and small together, while the irritated heart endeavours, with all its force, to overcome the resistances; but when the febrile cold is followed with heat, the increased velocity of the heart's motion will continue, until the cause, which disturbed the equability of the circulation, is either discharged from the body, or else so subdued and altered, as to be no longer hurtful; and thus the equable circulation of the humours returns to the state required in health. Hence, again, appears the truth of what was said

Sect. 573, 574. Of FEVERS in general. 41

said at § 558, namely, that a fever is often happily the cause of recovery.

It was not therefore without reason, that Helmont^a affirmed, *Attamen ipsa vita semper est intimum principale, formale, atque essenziale febrium efficiens, manetque ubivis materia occasionalis extra veram & internam causam materialem.* "That life itself is always the most intimate, formal, principal, essential and efficient cause of fevers, and that without any occasional matter it remains the true, internal, and material cause." For very numerous and different causes may excite a fever, either by an irritating stimulus, or by obstructing the free circulation of the humours, as we shall explain hereafter at § 586. Yet the fever itself thus produced, is distinct from these causes, and appears from what has been said to consist only in a quicker contraction of the heart.

S E C T. DLXXIV.

THIS quicker action of the heart therefore infers a quick reciprocal influx of the nervous fluid, from the cerebellum into the muscular fibres, as well as a quicker influx of the blood into the vessels and cavities of the heart.

We have made it evident in our Institutes, or academical lectures on the theory of physick^b, that the heart is truly a muscle, and that its contraction is performed, while all the muscular fibres, shortening together, diminish the length of the heart, increase its breadth, and accurately lessen the

^a De Febribus in fine capit. XVI. pag. 783. ^b H. Boerh. Instit. Medic. § 187.

42 Of FEVERS in general. Sect. 574.

the capacity of its ventricles; and that therefore the muscular motion of the heart proceeds from the same or the like causes with those which move the other muscles of the body. But it is directly proved by experiments^c, that a free influx of spirits through the nerves, and of blood through the arteries into the substance of the muscles, is necessary to enable them to contract: and therefore the same causes are required towards the contraction of the heart, as we have also proved by those experiments mentioned in the comment to § 170. No. 1. (4.) where we treated of such wounds as were absolutely mortal, by injuring the cardiac nerves. But, since as long as life continues, the heart alternately becomes at one time paralytic, and is in the next instant contracted with a sort of convulsive or swift motion; therefore these moving causes or powers must be applied to the heart alternately, and not continually. But it appears from the principles of anatomy and physiology, that the muscular motion of the heart, when in action, does, by a necessary mechanism, render its own muscular fibres paralytic, and that by this means, the whole heart is so disposed, that a new contraction must follow the moment after. For the nerves sent to the heart are so situated, that they must be compressed by the dilatation of the largest arteries, distended by the blood expelled from the heart, namely, the aorta and pulmonary artery, during the dilatation of which the venous sinuses and auricles of the heart are likewise distended; and therefore the influx of the spirits through the nerves, into the muscular fibres of the heart, is thus impeded, while at the same time all the blood is expressed through the vessels, dispersed through the substance of the heart, which

^c H. Boerh. Instit. Medic. § 401.

which therefore looks pale during its systole. Thus the two causes, which are absolutely required to muscular motion, are intercepted or removed; namely, the influx of spirits and arterial blood. But in that moment of time while the heart, as it were paralytic, has its cavities filled by the influent venal blood, the aorta is contracted, and with great force urges the blood through the orifices of the coronary arteries throughout the whole substance of the heart; and, at the same time, the nerves are no longer compressed, as the arteries are then contracted, and the sinuses and auricles emptied, whence they freely transmit the spirits sent from the cerebellum through the cardiac nerves to the heart; and therefore the two causes of muscular motion will be renewed, and thence the contraction of the heart will be instantly repeated.

But besides those causes of muscular motion which the heart has in common with the other muscles of the body, there still remains another cause; namely, the venal blood flowing into its auricles and ventricles. For we are taught by wonderful observations, that the motion of the heart may be renewed in dead bodies, if, by inflating the veins, the blood is urged into the cavities of the heart. Peyerus^d has observed in a dead cat, which had lain a long time stiff, that, upon blowing into the receptacle of the chyle, first the auricles, and then soon after the whole heart vibrated very often, and for several hours: he also observes, that this experiment is promoted by warmth, and that it even succeeds in dead bodies of the human species. He made the heart renew its pulsation in a stork, an hour after it had been killed by poison, merely by blowing air through the aorta. The like experiments

^d Parerg. Anatom. pag. 199. 201. pag. 297. 304.

44 Of FEVERS in general. Sect. 574.

ments are related by Wepfer*. If therefore the alternate motions of the heart could be thus renewed in a dead body, by impelling the blood or air into its cavities, how much more must this happen in the living animal, while the warm blood is impelled in large quantities, by a powerful contraction of the auricles and venous sinuses? It is therefore no wonder that the venal blood, being accelerated in its motions towards the heart by frictions, should increase the quickness of its contractions, and be able to excite a true fever.

To render therefore the contractions of the heart quicker, one or all of the forementioned causes must be increased, or else more frequently applied to the heart in a given time.

From hence then we begin to see, that though the proximate cause of a fever may be reduced to such great simplicity, yet those causes may be very numerous which are capable of increasing the causes of the heart's contraction, or which may apply them oftener to that muscle in a given time. For every thing which is capable of disturbing the equable motion of the most subtle fluid through the nerves; as for example, violent passions of the mind, a disorder of the encephalon, of the nerves, or of the heart itself, may have this effect. And again, all the causes which accelerate the motion of the venal blood towards the heart; as also a great many defects of vices in the circulating humours themselves, whether arising from a spontaneous depravity, or from their mixing with such particles from without, as by their stimulus may cause the heart, (which is so easily irritable, see the comment to §. I.) to make quicker contractions: concerning which we shall treat more largely hereafter.

S E C T.

* Histor. Cicutæ aquat. cap. 21.

S E C T. DLXXV.

ALMOST every fever as yet observed, and arising from an internal cause, begins first with the sense of cold, shivering, and trembling, more or less, of longer or shorter duration, and either internal or external, according to the diversity of the subject or patient, and of the causes of the fever itself.

It was declared, in the commentaries to § 563, what sort of a fever might be said to arise from an internal cause; namely, when the cause pre-existed some time in the body before the fever appeared. Almost the first sign or symptom felt by a person going to have a fever, is an unusual coldness, which at that time is generally ascribed to some other cause, while they are well, and suspect nothing so little as a fever. Soon after this the whole body begins to shake or tremble, almost in the same manner as when a person, going out of a hot house or warm bath, is suddenly exposed to great cold. But the degree of this coldness, with which the fever begins, is observed to be various, and more or less as to the time of duration; but generally the external parts of the body, and chiefly the extremities feel the cold, which is sometimes also perceived by the internal parts, while the external skin is but naturally hot; sometimes also in the worst fevers there is a most intense burning heat perceived about the præcordia, while the extremities are as cold as marble. But more especially does the degree of febrile coldness differ according to the variety of subjects. For the cold, which accompanies an incipient fever, is (*cæteris paribus*) much greater in
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46 Of FEVERS in general. Sect. 575, 576.
a decrepid old man, than in a strong youth, and greater in a cold leucophlegmatic body, than in one abounding with blood and good juices; because in these cases the patient's habit or temperature is naturally more inclined to cold. The febrile cold also frequently varies agreeable to the cause. For in the most malignant and dangerous fevers, the most intense and long continued coldness has been often observed, as we shall declare hereafter at § 623, where we are to treat of febrile coldness. For in such fevers the cause is so averse to nature, as to immediately infringe all the vital powers; whence the unfortunate patient, oppressed by the violent onset of the disease, has a severe and long continued chillness. The like diversity of coldness is also observed, according to the different nature of the fever itself. A quartan is usually accompanied in the beginning of a fit, with a violent and long continued coldness; but in the beginning of a fever of one day's continuance, there is often only a very slight sense of coldness perceived.

S E C T. DLXXVI.

DURING which time of the fever (§ 575.) the pulse is often quick, small, and intermitting; the extremities are often pale, cold, stiff, trembling, and insensible.

Quickness of the pulse is indeed observed throughout the whole time of the fever, as was said before at § 570; but, during the time of the febrile cold, there is always a great weakness perceived in the pulse, as well as quickness; whereas, on the contrary, in the heat of the fever the pulse strikes against the fingers of the physician very strong and full,

full, or large as well as quick. But very often there is so great a weakness observed in the pulse, during the cold fit of a fever, that the stroke of the artery is hardly perceptible to the touch, and this more especially in old people afflicted with a quartan fever in the winter time; and then also the quickness of the pulse is so great, that it seems rather to tremble, than to be made up of a distinct dilatation and contraction. But where there is so great a celerity of the pulse as to be ten times quicker than what is natural, no body can distinguish its numbers; but there is only a surprising undulatory motion perceived by the finger; and if the hand be applied to the breast, the heart seems to tremble, instead of beating powerfully against the ribs, as is usual in health: and in this case, sometimes the artery will give a stronger dilatation, and then again appear extremely weak and quick, and sometimes a true intermission of the pulse may be discerned in this case; and then the patient often complains in such a fever, that sometimes his eyes are blind, or that he cannot hear, or scarcely perceive. In this case, the same thing seems to take place, which appears to the eye before death in the dissection of living animals: for we then see that the heart, being no longer able to expel its contained blood at each systole, trembles, and evacuates only a part, not being able to make any great dilatation of the arteries: in the mean time, the auricles and venous sinuses are greatly distended, and, after a few moments of time, they are suddenly contracted, forcibly projecting their blood into the ventricles of the heart; which being then irritated by the quantity and impetus of the influent venal blood, is very powerfully contracted; then again trembling with a languid motion, until it be excited by the same cause, or until all motion ceases in the death of the animal.

animal. For, at this time, the greatest anxiety, most difficult respiration, and even the struggles of life with death, seem frequently to attend a fever, as we shall declare hereafter at § 589. Hence Galen^f justly pronounces; *In quartanarum principiis videbitur tibi arteria quodammodo esse alligata, atque ad interiora retracta, & prohiberi, ne insurgat.* “That in the beginning of quartans, the artery “will seem to you, in a manner, as if it was tied “up, and drawn inward, so as to prevent it from “dilating.” From what has been said, it is easy to explain another passage in Galen^g, where he places the most certain sign of an incipient quartan in a slowness and smallness of the pulse. For in the height of the cold fit the artery is often agitated with a tremulous and obscure motion, and then after a few moments, one shall be able to perceive a single and violent stroke or dilatation of the artery, which will then cease, and return again soon after: so that if one numbers those violent pulsations, the artery will seem to beat slow, when, at the same time, during the supposed intervals, it is extremely quick and weak in its motion. Add to this, that sometimes for a few moments the motion of the artery is intirely abolished, and a true syncope takes place. Hence it appears in how great danger the patient is at that time, and why death sometimes takes place in the cold fit.

At the same time also paleness is an usual symptom, beginning almost constantly in the extreme parts of the body, and therefore appearing first in the tip of the nose, corners of the eyes, and fingers ends; so that when the nails (which have a ruddy colour in healthy people, from their being in some measure pellucid, and from the subjacent blood-

^f Lib. II. de Crifibus cap. 3. Charter. Tom. VIII. pag. 412.

^g Ibid. cap. 4. pag. 413.

blood-vessels) begin to look pale, those afflicted with a quartan know that a fit is at hand. But that lively colour observed in a healthy person, arises from the vessels filled with red blood, so that when the force of the heart begins to be weakened from any cause, not being able to propel the blood to the extremities of the body, and the arteries at that time contracting by their own elasticity, especially towards their extremities, which are the least urged by the force of the heart, the blood is by that means repelled from the smaller into the larger branches; therefore the subcutaneous arteries, which are some of the smallest in the body, will be in a great measure emptied, whence a paleness will arise. For by this same cause we see, that a great paleness may arise without any loss of blood, when a pusillanimous man seeing the blood flow from the vein of another, is himself affrighted; for immediately after the face and hands are observed to turn pale, and frequently a true syncope or fainting ensues. From the same cause also a person looks pale by cold, when the small cutaneous arteries being contracted, repel their contained blood into the larger vessels; and therefore it is that external cold increases the paleness arising in the cold fit of a fever. In the greatest severity of the cold fit, the paleness is also usually accompanied with a livid colour, especially in the lips, because then the blood begins to stagnate in the veins, for want of the motion of the arterial blood, and from the larger veins and sinuses next the heart, with the whole lungs, being overcharged with blood. But the blood contained in the almost pellucid veins, gives a blue colour to the skin, which being intermixed with paleness, causes the livid colour, as it appears in dying people. Therefore in the cold fit of a fever, which

is violent, and of long continuance, there are observed a great many signs of approaching death.

Coldness.] It was demonstrated, in the commentary to § 100, where we treated on the effects of an increased circulation, that an increase of heat always proceeds from an increased motion of the circulation; and, on the other hand, that the heat decreases, as the circulation is diminished. Since, therefore, the force of the heart is in this stage of the fever so much weakened, that it cannot propel the blood to the extremities, it is evident enough coldness must be produced; for, so soon as the causes exciting animal heat in the body are deficient, all the parts exposed to the common air are reduced to the same temperature with itself, and they are then said to be cold, because the natural heat of our body always exceeds the heat of the air.

Stiff.] To maintain a due flexibility in the parts of the human body, requires such a cohesion of the solids as will enable them to be elongated, and to give way to those motions to which they ought to be obedient for the exercise of all the functions in a just manner. It was said before upon another occasion in the comment to § 43, that the human body was so much softer and more flexible, as it was younger or nearer its origin, because then the solid parts are the most tender, and the fluids abound in the greatest quantity; but as age advances, great numbers of the small vessels, after expelling their contained humours, concrete together, whence the body becomes firmer, but less flexible, till at length, in a decrepid old age, the whole in a manner becomes rigid or inflexible. Hence it is evident, that the parts are more pliable, in proportion as there is a greater abundance of humours with respect to the solid parts; but in the beginning of a fever, the force of the heart being weakened, cannot fill the
smallest

Sect. 576. Of FEVERS in general. 51

smallest vessels in the extreme parts of the body; and therefore these being contracted, and repelling back their contained juices into the larger vessels, this will be one cause of the rigor or stiffness in the beginning of fevers. But besides this, the cold, which contracts every thing, will increase the cohesion of the solid parts, and consequently augment their stiffness: and the truth of this every one have experienced, who have had their hands extremely cold in the winter time; in consequence of which the fingers have been so stiff, as to be scarce able to take hold of any thing. Since therefore these two causes concur, it is no wonder that a very great stiffness often arises in the time of the cold fit in fevers.

A trembling supposes a short, involuntary, and mutual succession of the causes, which contract and relax the muscles, as will be hereafter explained more at large under § 627, where we treat professedly of febrile tremors. But the causes distending the muscles are an influx of the arterial blood, and of the spirits by the nerves. But the pulse being quick, small, and often intermitting, demonstrates that the motion of the arterial blood is irregular or wavering, or that it is deficient one moment, and urged in again the next. But also the motion of the spirits through the nerves requires the continued motion of the arterial blood through the vessels of the encephalon; and therefore this course of the blood being interrupted or wavering, will likewise disturb the equable motion of the spirits through the nerves. The two causes of muscular motion therefore being thus wavering, will produce a trembling; and that often so violent, that after the fit is over all the limbs are in pain for some time from the violent concussions.

52 Of FEVERS in general. Sect. 576, 577.

Insensibility, which is only observed in the greatest severity of the febrile cold; for then the blood is accumulated, and stagnates in the larger veins and sinuses about the heart, while but a little of it only can be propelled through the lungs by the weak action of the heart, as is evident from the great anxiety which then always attends. The jugular veins therefore cannot freely empty themselves at that time, whence the encephalon is overcharged, so that the patient can hardly be sensible of any thing further, but lies heavy and stupid, insomuch that by sad experience we find, the unfortunate patient has sometimes burnt the soles of his feet to the bone, without any sense of pain, by applying them to the stove to lessen the painful sense of cold. Besides this, the cold itself of the extreme parts will also increase their insensibility; of the truth of which we are assured by daily observation, when the hands or feet are benumbed, and almost entirely destitute of sense by the severity of frost in winter-time, and in people otherwise well in health.

S E C T. DLXXVII.

HENCE it is evident, that the blood at that time stagnates in the smallest or extreme vessels, and yet that at the same time there is a cause irritating the heart (§ 574.)

The two particulars remarked in this paragraph are the chief observable in this stage of the fever, and ought especially to be taken notice of. For the blood and humours stagnate in the extreme vessels, from the deficiency of those causes which maintain them in motion during health. For, that the humours may have a free motion through the vessels,

fels, three things are required; namely, for the magnitude of the humours to be transmitted to be such as will allow them to pass through the ultimate and smallest extremities of the arteries; and then, that the vessels transmitting those humours retain their due amplitude; and, lastly, for the moving causes to propel the humours through the vessels with a due force. But, in the cold fit of a fever, the vessels are contracted and made narrower by the general effect of the cold, while, at the same time, the particles of the blood are united together, in the manner described before at § 117, and therefore, from both these causes, the free course of the blood through the extreme vessels will be impeded; and this more especially, as at the same time the moving power, namely, the contraction of the heart, loses of its due force; and therefore it is sufficiently evident that a stagnation must follow.

But at the same time this stagnation of the blood in the extreme parts of the body is accompanied with an irritation and more frequent contraction of the heart, the cause of which still remains to be enquired after. It was said before (§ 574.) that a quicker contraction of the heart arose from a quicker reciprocal influx of the nervous juice into the muscles, and of blood into the vessels and cavities of that organ. But since the other muscles of the body shake and tremble from a too weak and unequal influx of blood and spirits into them, as was said under the preceding aphorism; so the same effect seems to proceed from the same causes in the heart. But the veins being contracted during the febrile cold, drive their contained blood towards the right auricle and ventricle of the heart; and since it appears evident, from what was said in the comment to § 574, that the motion of the heart may

54 Of FEVERS in general. Sect. 577, 578.

be renewed even after death, by urging the venal blood or flatus into the right ventricle; it is also equally evident, that this very powerful cause attends during the whole fit of the fever, whereby the heart is irritated into more frequent contractions. But since at the same time the influx of the nervous fluid and blood into the muscles of the heart is languid and irregular, it will therefore be indeed contracted quicker by the irritation of the affluent venal blood, but then its action will be weaker, so that the heart will not be able to drive the blood with its usual force, through the arteries, nor will it be able entirely to empty its ventricles, because of the increased resistances at the extremities of the arteries; and therefore the heart will very swiftly palpitate in the greatest severity of the cold fit of a fever, in order to supply the deficiency of its strength, by oftener repeating its contractions. At this time, therefore, the pulse will be extremely quick, but the circulation extremely weak, from a right understanding of which all those particulars may be explained, which are observed in the cold fit of a fever, as will be said under the following aphorism.

S E C T. DLXXVIII.

FROM hence (§ 577.) is understood the cause of all the circumstances or phænomena (§ 575, 576.) then appearing.

For, the venal blood being derived to the right side of the heart, through the veins, contracted by the cold of the extremities, will therefore irritate the heart, whose left ventricle in the mean time not being able to overcome the increased resistance at the extremities of the arteries, will there-

Sect. 578. Of FEVERS in general. 55

therefore palpitate or contract quicker, but with less force than in health. But the left side of the heart, by an intervention of the wonderful organ, the cerebellum, does itself procure the cause of its own muscular motion; for the action of the cerebellum upon the heart through the nerves, depends upon the action of the heart itself, by the arteries upon the cerebellum; since, therefore, the left ventricle of the heart then drives the blood with less force through the arteries of the cerebellum, this last must therefore act with less efficacy again upon the heart by the nerves. Indeed in other muscles serving to voluntary motion, the application of this last cause, through the nerves, is made by the influence of the mind; but the muscular motion of the heart is produced and destroyed alternately by the created fabric of the parts, without any previous determination of the mind. For no one living is able, by the strongest endeavours of the will, either to increase or retard the motion of the heart. Besides this, as the weaker contraction of the left ventricle makes a less dilatation of the aorta, that will again be contracted with less force, while the heart is dilating: but it is from this contraction of the aorta, that the blood is impelled through the coronary arteries and substance of the heart itself; whence it is evident, that the two causes of all muscular motion, namely, the influx of arterial blood and nervous spirits are thus diminished, and that thence must necessarily follow a weaker contraction of the heart; and yet that at the same time the irritation made by the venal blood urged towards the right ventricle may excite the heart to quicker contractions. Great anxiety or oppression will therefore follow, from the free egress of the blood from the heart being impeded, as we shall

56 Of FEVERS in general. Sect. 578, 579. hereafter demonstrate at § 631. At the same time there is often great weakness, because the free circulation of the humours through the encephalon is impeded, whence trembling, insensibility, &c. follow, as we enumerated and explained them before at § 576.

S E C T. DLXXIX.

IN every fever, after these symptoms have preceded (§ 575, 576, 577.) arises heat more or less, of longer or shorter duration, either internal, external, universal, or local, according to the different nature of the fever.

After the febrile cold, with all its appearances, has continued for some time, the powers of the heart gradually increase, and the resistance about the ends of the arteries is diminished; whence a heat, together with the blood, extends to the extreme parts of the body, the pulsation of the arteries becomes stronger and fuller, the paleness goes off, and the heart continues to be contracted, not only quicker, but it more powerfully propels its contained blood through the arteries, which are now less resisting; and since heat follows from an increased motion of the blood thro' the vessels, (see the comment to § 100.) the febrile cold will be lessening every moment, till the whole body recovers its natural heat, which, by the continuance of the same causes, is afterwards gradually increased. But this takes place in every fever, unless the patient should be suffocated in the cold fit, which has been sometimes observed. Even in intermitting fevers, if the patient is not very weak,

weak, or advanced in years, the hot fit is usually so much the more intense, as the preceding cold was more violent.

Now, according to the different nature of the fever, this heat will vary in degree, duration, and place. The fever which is called an ephemera, and the simple continent have only a gentle heat and moisture a little greater than what is natural; but a putrid continent has a much more intense heat, which in a manner pricks or offends the touch of the finger; (see § 731.) and in a true ardent fever, the heat is perceived burning to the touch, and the expired air itself scalding (see § 739.) Even in the plague, the violence of the disease being levelled against some certain parts of the body, burns them up into an eschar like actual fire. In a true and exquisite tertian, which never exceeds the space of twelve hours, this heat continues but for a few hours: but in continual fevers, it is extended to several days, or even weeks; and in hectic fevers this heat often dries up and preys upon the body for several months.

It is one of the best signs if the febrile heat is equally diffused throughout the whole body, even to the extremities; for it denotes that the vessels are pervious, and that the blood has a free course: But in the worst fevers, which are then commonly fatal, there sometimes happens an intense heat perceived about the vital organs, while, at the same time, the extreme parts of the body are cold; and it then denotes that the circulation is deficient in the extreme parts of the body, and that the impervious blood begins to be stagnated or accumulated about the vital viscera; while, in the mean time, the heart being more swiftly contracted, propels the blood with a great velocity through the vessels, which are yet pervious in the parts next adjacent.

But

But when in acute febrile diseases the fever is accompanied with an inflammation in some particular part of the body, then the heat is observed greatest in the part chiefly affected, although the rest of the body is likewise violently heated : thus, in a true phrenzy, a great pain and heat is perceived in the head (see § 772 ;) in an inflammatory quinsy a most intense heat is seated in the fauces; and the same is also true in the other inflammatory diseases. Hence Hippocrates ^b tells us, that by the greater heat the part affected may be discovered, where he says, *Quibus latus sublatum in tumorem ac calidius est, & inclinatis in alterum gravitas aliqua impendere videtur, his pus ex una parte est.* “ In those who have a tumour and heat in “ the side, and when they lie down there seems to “ be the sense of an impending weight on the “ other side; in these there is matter contained “ in the one side.” And in another place ^c, in order to determine the part which ought to be opened by incision or caustic in an empyema, he orders the thorax to be covered all round with a piece of thin linen dipped in a warm solution of red earth ground very fine, and where it appears to be dried first, he would have the incision or caustic applied.

^b Coac. Prænot. N°. 428. Charter. Tom VIII. pag. 877.

^c De Morbis Lib. III. cap. 15. Charter. Tom. VII. pag. 593.

S E C T. DLXXX.

WHICH heat (§ 579.) as it follows from the fever, already formed, is evidently more an effect thereof than the cause, nature, or essence of the fever.

It was said before in the comments to § 560 and 570, that it was the opinion of Galen, and almost all the physicians after him, that the essence of a fever consisted in an increased heat. But it evidently appears, from what was said before, that a true fever attends before there is an increased heat; and therefore the essence of a fever cannot consist in heat, nor can heat be termed the cause of the fever, since it is altogether repugnant to reason, that a cause should follow after its effect, which it must precede. Helmont, who endeavoured every way to subvert the opinions of the medical schools, which prevailed in his time, and often without reason, has nevertheless well observed here, that a fever cannot be defined a preternatural heat. For it is his opinion, that the fever is excited by life itself, in order to expel something troublesome or offensive to the body, or at least so to alter the matter that it may be no longer offensive; and as inflammation, heat, pain, &c. are excited by a thorn in the flesh until it is removed, the same he judged to take place in a fever; and therefore he has pleased himself with calling the cause, by whose stimulus life is excited to a greater motion, by the denomination of a thorn. Hence he pronounces *, *Itaque febris non est nuda caloris tempestas: sed adest occasionalis vitiata materia, ad*
cujus

* De Febris cap. 4. N° 20. pag. 751.

cujus expulsiōem Archeus per accidens se accendit, velut indignatus. “ Therefore the fever is not a
 “ mere raging of heat, but there is some mor-
 “ bific or viciated matter as the cause; for the ex-
 “ pulsion of which the archeus kindles itself by
 “ accident as in a rage.” But it is evident from
 the passage of Helmont, which we quoted in the
 comment to § 573, that by this name archeus, he
 would have us understand life itself. In another
 place he explains this opinion more at large in the
 following words¹: *Nimirum causa peccans in febre
 non calet ex se: calefacit autem tantum occasionaliter,
 & ad spinæ sive causæ occasionalis evulsionem sequi-
 tur sanitas. Solus ubique Archeus effectivè febrim
 concitat, & quo abeunte per mortem, cessat cum eo
 febris. Ergo calor est accidens posterius, & subse-
 quens ad febris essentiam. Accendit nimirum se ip-
 sum Archeus in nisu, quo cuperet expellere materiam
 occasionalem, tanquam sibi impactam spinam. Hanc
 autem quicumque aufert, sive id fiat per calida media,
 sive per temperata, sive demum per frigida, is mor-
 bum a radice tollit; & est naturæ quasi indifferens,
 quia eo ipso sedatur cessatque thymosis Archei, &c.*
 “ That the cause offending in the fever does not
 “ grow hot of itself, but is only an occasional
 “ cause of it, and that health follows after the
 “ thorn, or occasional cause is thrown out. But
 “ the archeus only effectually raises the fever in
 “ every part of the body, from whence departing
 “ by death, the fever ceases together with it-
 “ self. Heat is therefore an accident posterior or
 “ subsequent to the essence of the fever: for the
 “ archeus employs all its forces in the endeavour
 “ which it makes to expel the occasional matter
 “ as a thorn run into the flesh. But whoever re-
 “ moves this thorn or matter, whether by medi-
 “ cines

¹ De Febribus cap. 1. N°. 29. pag. 741.

Sect. 580, 581. Of FEVERS in general. 61

“ cines, heating, temperate, or cooling, he radically cures the disease; for nature is indifferent to either, because by the removal of that cause only, the disturbance of the archeus is quieted and ceases, &c.

S E C T. DLXXXI.

AND therefore a quicker contraction of the heart, with an increased resistance at the capillary vessels, completes the essence or idea of every acute fever.

An increased velocity of the pulse is the pathognomonic sign of every fever (as was said before at § 571); which has for its proximate cause a quicker contraction of the heart, as was demonstrated in the comment to § 573. But when this quicker contraction of the heart is joined with an increased resistance at the capillary vessels, that is, at the extremities of the arteries, we have then the idea of an acute fever, which is dangerous as well as swift in its progress, as was said before at § 564. For when a healthy person runs swiftly for some minutes, the venal blood is derived with a greater celerity and impetus towards the right side of the heart, which is therefore obliged to contract more frequently, and thence a true fever ensues: but if such a person does but rest for a quarter of an hour, that motion of the blood will be quieted, and there will be no further sign of a fever remaining; which fever therefore, as it terminates its course very quickly, but without danger, cannot in any wise be properly termed an acute fever. But when the same person has been running for a long time beyond his strength, the most fluid parts

62 Of FEVERS in general. Sect. 581, 582.

parts of the blood being discharged in sweats, and the rest condensed or compacted together by the violent action of the vessels upon their contained humours, the blood at length becomes so impervious, that it can no longer run freely through the smallest capillary arteries; the resistance of the heart will be therefore in this manner increased, whence a most acute fever may arise, which is often suddenly fatal, whereas before those obstacles, the quicker contraction of the heart would be quieted in a little time only by rest of body. The same thing has frequently happened, when people being heated by violent exercise, immediately drink cold liquors, or imprudently expose themselves to the cold air, whence they are destroyed by the most acute diseases; for by the cold admitted, the vessels are contracted, and the particles of the blood united together, after having been already too much disposed to run into concretions, by the consumption of the more fluid part in sweats.

S E C T. DLXXXII.

BUT both these (§ 581.) may be produced in a living animal, by an infinite number and variety of causes, acting either separately or conjunctly, and easily following in succession the one from the other.

It is evident from what has hitherto been said, that what we know concerning the nature of a fever by the apparent symptoms, may be reduced to very great simplicity, and that therefore we may very easily distinguish whether a fever is present or not, since there is an increased velocity

Sect. 582. Of FEVERS in general. 63

city of the pulse throughout the whole time of every fever. But as there are an infinite number and variety of causes which may produce that quicker contraction of the heart, from whence the increased velocity of the pulse arises, that simplicity no longer remains, but we often meet with greater difficulty both in discovering and distinguishing the remote causes, than in removing them. For it will hereafter appear, when we come to enumerate the principal causes of fevers in certain distinct classes, that the quickness of the heart's contraction may be increased by the various passions of the mind, by meat and drink, the different temperatures of the air, things externally applied, other diseases going before, &c. but again the increased resistance about the smallest extremities of the arteries may arise from very numerous causes; for all the causes of obstruction, however numerous, either by default in the fluids, solids, or both together, may be hitherto referred.

But though both these immediate causes, namely, a quicker contraction of the heart, and a greater resistance about the capillary arterial vessels, may exist separately in the body, yet either of these hardly continues long alone, but the one is easily followed by the other. For as is evident by what we said in the comment to § 100, concerning the effect of the increased motion of the blood through the vessels, this increased velocity cannot long subsist, but by the greater reaction of the vessels upon the blood, and their violent compression of the same, the more fluid parts will be expelled, whence a driness and inflammatory viscosity of the blood will arise, by which it will be rendered unfit to circulate freely thro' the narrowest extremities of the arteries. On the other hand, if the resistance about the capillary arteries is increased, the quickness of the contraction

64 Of FEVERS in general. Sect. 582, 583.
traction of the heart must also be soon increased. For in the comment to § 120 it was demonstrated, that when a great number of vessels is obstructed, the velocity of the humours must be increased thro' the other pervious vessels, which cannot happen, unless the velocity of the heart's motion is at the same time increased. For the velocity of the humours being in this case increased through the open vessels, will drive the venal blood in a greater quantity and impetus to the cavities of the heart, and the blood will flow more swiftly and strongly, through the coronary arteries into the substance of the heart, while at the same time the arterial blood will pass more swiftly through the cerebellum; and therefore there will be a greater secretion of vital spirits, and a quicker motion of them through the nerves to the heart. From hence it is evident that the three causes (§ 574.) from whence the motion of the heart results, will be oftener applied in a given time to the heart, which will be therefore more frequently contracted.

S E C T. DLXXXIII.

THE proximate cause therefore of a fever (§ 581.) acknowledges an infinite number of causes for its proximate or immediate ones.

For whatever can increase any one or all of the causes which produce the contraction of the heart; as also all the causes, which give a greater resistance to the humours moved by the force of the heart through the ultimate extremities of the arteries, may be proximate causes, with respect to those which immediately produce the fever.

S E C T.

S E C T. DLXXXIV.

THESSE causes are, however, divided into such as are peculiar to every individual person, and such as are universal or in common to most people, which are generally owing to their living with the same air, diet, and course of life.

But to observe order, among such a numerous variety of remote causes of a fever, it will be most convenient to divide and subdivide them into certain classes, that we may the more certainly and easily find them out.

The first and most general division of these causes is into those peculiar to every individual person afflicted with a fever (and which may be therefore different almost in every one; as when, for example, one has a fever from a crapula or surfeit, another from overwatching, a third from too much exercise of body, &c.) or they are such as are common to many people at the same time, as being generally seated in those things, which cannot be avoided in the common uses of life; thus the cause spreading a fever among many people living in the same place, frequently resides in the air, the fever being accompanied with almost the like symptoms in every patient, and requiring the same method of cure, as will be hereafter explained more at large, when we come to treat professedly of epidemical diseases. Sometimes these universal causes of fevers residing in the air proceed from its manifest qualities of heat, cold, humidity, driness, &c. and sometimes there is something of an unknown matter applied, or taken into our bodies together with

66 Of FEVERS in general. Sect. 584, 585.
the air, which yet produces similar effects among all, as in the plague, small-pox, &c. These common causes of fevers are likewise often owing to the diet or provisions, as it frequently appears in besieged cities, when hard necessity oppresses both the rich as well as the poor, and obliges all of them to use an ill diet, so that the like diseases afflict them from a common cause. Thus a most severe pestilence raged in Breda, when the besieged inhabitants were obliged by extreme hunger to make use of an unhealthy diet ^m. Hippocrates ⁿ also remarks, that the use of stagnant waters of the fens in the winter time, excited peripneumonic and maniacal disorders in young people, and ardent fevers in old people. But how the same course of life disposes people to suffer the like diseases, has been taught by Ramazini, in his Treatise of the Diseases of Tradesmen.

S E C T. DLXXXV.

THE causes therefore of a fever, are either particular or epidemic.

It was said, in the comment to § 566, that Hippocrates distinguished all fevers into two kinds; namely, according as they proceeded from a cause common to every one, or from the diet peculiar only to some. This general division is therefore justly retained. Those are properly termed epidemical causes of diseases, which affect many inhabitants of the same country at one time, but which do not always predominate in that country. But since the epidemical causes of fevers are in this aphorism

^m Vander Mye de Morbis Bredanis, pag. 17. ⁿ De Aëre locis & aquis. Charter. Tom VI. pag. 195.

Sect. 585, 586. Of FEVERS in general. 67

aphorism said to be those, which in the preceding one were called universal, and common to most people; it is therefore evident, that under this title are also understood the endemic causes of fevers, which not only prevail at certain seasons, but also generally afflict the inhabitants of the same country, because they derive their origin from such permanent causes, as are peculiar to such a country; thus, according to the different situations of cities, with respect to the course of the winds, Hippocrates^o has observed them to be liable to epidemical diseases. But the particular causes of fevers will be enumerated in the next paragraph.

S E C T. DLXXXVI.

THE more immediate particular causes (§ 583.) of fevers may be reduced to certain heads: as (1.) the ingesta, or every thing acrimonious taken into the body, whether under the denomination of food, drink, sauces, medicines or poisons, having such properties that they cannot be digested in, moved thro', or discharged out of the body; or when they are taken in such a quantity, that they irritate, suffocate, obstruct or putrify: (2.) the retenta, things retained within the body, which ought to be expelled, whether from cold, uncutions, sorrowful passions of the mind, meat, drink, medicines, poisons, a damp foggy air, rest, a neglect of wonted exercises, obstructions and compressions, either from the contents of the vessels themselves, or from the ambient parts or bodies: (3.) the gesta, or actions ei-

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ther

^o De Aëre locis & aquis. Charter, Tom. VI. pag. 189, &c.

68 Of FEVERS in general. Sect. 586.
ther of mind or body, as too violent exercise,
heat, &c. (4.) the applicata, or things exter-
nally applied to the body, being acrid, pun-
gent, corroding, lacerating, burning or inflam-
ing; (5.) such things as produce great al-
terations in the humours and their motions,
of which kind there are many, both external
and internal, as hunger, evacuations, matter,
water, ichor in such as have a dropsy or em-
pyema, sharp serum collected in any part, ex-
alted bile, an inflammation, suppuration, gan-
grene, cancer, over-watching, or want of
sleep, too intense study of any kind, excess
of venery, &c.

Many of the causes here enumerated, do not ex-
cite a fever in all, but only, or at least most fre-
quently, in those who are predisposed; for, as we
said before, in the comment to § 11, the causes of
diseases are either predisposing or occasional. The
first or proegumenal are so called, because they
predispose the body to disease upon the accession of
another cause, which would not have been of itself
sufficient to have produced the disease, without the
assistance of those predisposing causes: as, for ex-
ample, a difficult digestion of the aliments does not
excite a fever in every one; for the strong bowels
of an husbandman can dispense with such aliments,
which would very much indispose a weak or tender
person troubled with a relaxation of the stomach.
Not every one who labours hard in the scorching
heats of the summer, is thereby thrown into a fe-
ver, but those chiefly are in danger of this, who
are troubled with a plethora, or whose natural con-
stitution inclines to heat. Hence Galen rather chu-
ses

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ses to call them occasions than causes of diseases, which only excite disorders in bodies predisposed; and, in treating of fevers, he observes^p; *Quod nulla causa sine corporis aptitudine agere possit: alioquin omnes, qui in sole versantur æstivo, febricitarent; & qui plus æquo moventur, aut vinum bibunt, aut irascuntur, aut mærent, &c.* “ That no cause can act
“ without an aptitude in the body; otherwise every
“ one who works in the summer sun would have a
“ fever, and all those who have exercised too much,
“ drank too much wine, or have given themselves
“ over to anger or grief, &c.”

But that those occasional causes of fevers may be reduced to order, and better retained in the memory of the physician, it will be convenient to rank them under the five following classes, by running over which, he may find the one or more of them which have excited the fever he examines; that the cause being thus known, he may determine, agreeable to the rules of art, what method of cure, and what remedies may be required to remove it.

(1.) *Ingesta.*] All the healthy humours in the body have scarce the least acrimony, if we except only the excrementitious; namely, the urine and bile; for the blood of a healthy person excites not the least pain to a naked wound, nor upon being dropped into the eye: hence all acrimony seems to be foreign to human nature, and every thing, which by too long retention in the body becomes acrid, departs from the rest of the humours, and is discharged either by urine, stool, or insensible perspiration; and therefore naturally all the humours are in health without acrimony. But then such things as have a notable acrimony, may be received into the body from without. The first passages, as they are called,

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in

^p Galen. De Febr. Lib. I. cap. 6. Charter. Tom. VII. pag. 112.

in the body, which receive, digest, and change the swallowed aliments, so that they may be afterwards converted into our own nature by the action of the vessels and viscera, do very often sustain acrimony, which, if it was received into the blood, would immediately disturb all the functions. Thus, even wine, spirit of wine, and even alcohol itself, are safely swallowed by many, and the most biting spices, salts, &c. are often taken without injury to the stomach or intestines. But when any quantity of those acrid ingesta enter by the lacteal vessels, or absorbing veins, into the stomach and intestines, so as to mix with the blood; the heart, which is so wonderfully irritable, may thereby be brought into quicker contractions, and the circulatory motion of the blood increased, as was demonstrated in the comment to § 99. Indeed there is a faithful guard placed here to prevent the too crude or acrid ingesta from easily entering the blood; namely, a contraction of the mouths of the absorbing veins and lacteal vessels by such greater acrimony, which is by that means not easily admitted. But yet it cannot be denied, but part of the acrid ingesta, mixing with the mild and diluting humours, may sometimes insinuate into the blood; for it appears, from the most certain observations, that the sucking infant has been thrown into the worst convulsions, by drinking in, together with the milk from the breast of a drunken nurse, the acrimony of fermented liquors, intolerable to its tender body. The force of a purge taken by the nurse, is often and with danger felt by the unhappy infant; and even the smell of garlic eaten may be perceived in the milk. From whence it is evident, that all passage is not entirely denied to acrid humours penetrating into the blood. Such a slight acrimony being received into the blood of a strong and healthy person,

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son, may, by the action of the vessels and viscera, and by mixing with the mild humours, soon be overpowered, or else discharged from the body; but as long as that acrimony retains its nature in the blood, it may increase the velocity of its circulation by its stimulus. But these are taken into the body under the denomination of

Food or aliments, which are either already acrid at their eating, or become so in a little time, by staying too long in the warm stomach. Thus milk in weak people frequently turns sour, and the flesh of animals, especially those of prey, living upon other animals, easily degenerates into a putrid acrimony. The livers of fish abounding with a soft oil, are soon converted into a rancid oily acrimony, and frequently excite a fever, or else cause a relapse in those who are recovering from that disorder. But besides this, aliments are sometimes taken, which have already a great acrimony in themselves, as old cheese, salted or dried fish and flesh, rancid oils, &c.

Drinks.] Namely, when these are prepared by fermentation. For new ale, milk, whey, and the like, never offend by acrimony, unless they are already sour, or become so in weak bodies. But that acrimony, which is inherent in fermented liquors, may, by a very wonderful and powerful stimulus, increase the quickness of the heart's motion; and hence it is that a moderate use of rich wine and ale proves so serviceable in languid and cold diseases. But immoderate use of these liquors is too well known to excite fevers called surfeits; but these are slight, and are usually despised by those who are accustomed to have their veins filled with wine drunk the day before. But it was observed from Hippocrates, in the comment to § 558, that extreme drunkenness is followed with a loss of speech, and sometimes with a fatal apoplexy, unless a fever arising

sing should prove a remedy. The fourth and fifth patient, mentioned by Hippocrates in his third book of Epidemics ^q, were both of them ill of a dangerous fever from drinking; and the first of these became deaf on the second day of the disease, afterwards became delirious and raving, was convulsed on the fourth day, and died on the fifth: but the other recovered on the twentieth day after a severe disease: the son of a Grammarian being troubled with intense thirst, and not finding any water, drank freely of old wine, and from that time continued watchful, but was afterwards taken with a fever, with watchings, and perished delirious ^r.

Sauces.] They who live a frugal life with daily exercises of body, find hunger the best sauce or seasoning to their food; but those who live in sloth and idleness, or who have lost their strength of body by gluttony and drinking, are obliged to excite an appetite in their weak stomachs by these artificial incentives. All these are usually made of the most acrid spices, pepper, garlic, onions, &c. with the addition of salt, vinegar, wine, and other things; in the composition of which an infinite variety is made out by a learned appetite or palate. All these, therefore, as they consist of the strongest stimulating substances, may increase the quickness of the heart's contraction, that is, they may excite a fever. It is an usual remedy with the common people for a weak stomach to swallow whole grains of pepper; nor do they from thence receive much damage, inasmuch as they are discharged whole as they were taken in, and but little altered: but I have seen a most ardent and dangerous fever raised in a person, who had swallowed a great quantity of beaten pepper; for this hottest of spices retains its strength

^q Charter. Tom. IX. pag. 232, 233. ^r Galen. de locis affectis Lib. II. in fine Capitis ultimi. Charter. Tom. VII. p. 423.

strength so firmly, that I have not been able to discharge it even by the eighth time of boiling in a great quantity of pure water, and therefore it continues to act by its stimulus as long as it is retained in the body. A very robust countryman, in the flower of his age, being a long time afflicted with a quartan, did, by the advice of a rash mountebank, take a large quantity of ground mustard in gin about three hours before the fit, but with the most fatal event; for his innocent quartan, which was grown much milder by the vernal warmth, was now converted into the most burning fever, which killed him in the space of three days.

Medicines.] In chronical and cold diseases, as in a dropsy, palsy, and apoplexy of some kinds, &c. all the hopes of a cure are placed in exciting a fever, either spontaneously or by art, and then the hottest and most stimulating medicines are given with the greatest success. But sometimes also purging and vomiting medicines do in their operation excite a very great disturbance in the body, and too much increase the quickness of the circulation; though, in the mean time, the nature of the disease to be cured, requires the motion of the blood to be sedate. Hence Sydenham* justly advises, that when a purge or vomit is necessary to be given in acute continual fevers, bleeding ought to be premised to prevent the too great agitation in the blood, which must arise from these medicines. And this he has inculcated the oftener, because many physicians had espoused an opinion that bleeding was pernicious, unless the *primæ viæ* were first cleansed; namely, for fear the depleted

* *Epistola Respons. prima pag. 395. & Sect. I. cap. 4. pag. 65. Et in Schedula Monitoria de novæ febris ingressu, pag. 677.*

depleted veins should attract the offending humours, as may be seen in Sennertus, Forestus, and others.

Poisons.] Among poisons there are some which exhibit a manifest acrimony to the senses, as arsenic, corrosive sublimate, &c. And it appears from manifold observations, that not only sudden death, but also the most obstinate and malignant fevers have been raised by taking of these poisons. Among many remarkable instances which Wepfer^{*} has collected concerning the bad effects of arsenic, there is also a case which confirms what is here advanced; *Puella enim, incautè devorato arsenico, toto die vomuit: neglecta per triennium morboſa supervixit, ac tabida ex febre, cujus indolem nemo agnoscere potuit, obiit.* “For a girl having
 “unwarily swallowed some arsenic, vomited
 “the whole day; but she being neglected survived for three years, but perished tabid with
 “a fever, the nature of which no body could
 “discover.” But there are other poisons which by a wonderful force disturb the whole body, excite the most acute fevers, and even death itself, altho’ that cannot be reduced to any acrimony as yet known, which is contained in these so active poisons, which even sometimes seem mild to the senses. Thus the viperine poison (as was said in the commentary to § 155.) resembles in colour and taste oil of almonds. Who will pretend to determine the nature of the poison in the small-pox, which makes such havock, and alters the most healthy humours into the most malignant nature, though its subtlety escapes all our enquiry, and whose force is such, that the least drop of the variolous matter is able to affect another person in perfect health, as we are taught by inoculating the
 small.

* *Cicutæ aquat. historia pag. 281.*

small-pox. The same is also true in the plague and other contagious diseases. In all these we know the cause of the fever by observation, and we see the effects; but the manner in which the cause applied to the body produces those effects, is altogether concealed from us.

Having such properties that they cannot be digested in, moved through, or discharged out of the body.] What we take in are said to be digested, when they are so changed by the actions of the vessels and viscera, and by mixing with the humours of the body, that they become like those humours, and at the same time such parts as are not thus altered, and which cannot be overcome by the digestive powers, are in due time, and by the usual passages, discharged out of the body. It is therefore necessary, in order for what is taken into the body to be digested, that the alterative or concoctive powers prevail over the strength and cohesion of what is taken in: there may be therefore a two-fold cause impeding this digestion or attenuation, namely, a weakness of the assimilating powers, and too great a cohesion or tenacity of the substances taken into the body, both which causes may either happen separately, or concur together at the same time. The hardy ploughman not only eats beef and bacon, which have been salted and dried in the smoak, without any detriment, but he is thereby well nourished; whereas a weak girl would be oppressed and made feverish with such aliments. It is therefore required, as Galen well says, in a passage we before cited in the comment. to § 25. *Ut concoquendum familiarem habuerit naturam respectu coquentis: tunc enim corpore secundum naturam se habente mutatio & alteratio totius substantiæ coquendi fit, aut maximæ ejus partis, &c.* “ For the nature of the
“ food

76 Of FEVERS in general. Sect. 586.

“ food to be concocted to have a proper affinity
 “ with respect to the stomach that is to digest it,
 “ which will cause a due change or alteration
 “ throughout the whole substance, or at least the
 “ greatest part of what is to be digested.” But it
 appears, from daily observation, that when food
 of difficult digestion is taken into the body, or
 even too great a quantity of food in its own na-
 ture easy of digestion, the person becomes indis-
 posed, grows hot, thirsty, and at the same time
 there is an increased quickness of the pulse, that is
 to say, a true fever attends, by which the efficacy
 of the vessels upon the humours being increased,
 those parts may be divided, which otherwise could
 not by the natural and sedate motion of the hu-
 mours. There is no body but has experienced this
 at some time or other in themselves. Such slight
 fevers arising in healthy people from small errors of
 diet, and lasting but for a few hours, are easily
 removed; but even from this cause only in the
 weaker sort of people, a very intense fever is
 sometimes kindled, and the daily taking in such
 food of difficult digestion, will often excite fe-
 vers of the most stubborn kind. Galen^a, with
 two young men, his companions, being in the
 country, at a great distance from the city, and
 finding no provisions, the sharpness of his ap-
 petite made him eat plentifully of boiled wheat,
 only seasoned with salt; but he soon after per-
 ceived a weight in his stomach, and the next day
 loathed all food, was troubled with flatulencies, his
 head ached, and his eyes looked red, nor yet did
 he discharge any thing by stool. His compani-
 ons were likewise all troubled with the like com-
 plaints. For the crude wheat not being fermented,
 was

^a De Alimentor. Facultat. Lib. I. cap. 7. Charter. Tom.
 VI. pag. 314.

was so glutinous and tenacious, that it could not be digested in, moved through, and discharged from such juvenile bodies. And even the rustics confessed, that when they are through necessity obliged to live upon this food, they find it heavy and difficult of digestion. Thus we often see infants, whose parents, pressed with poverty, being obliged to feed them daily with crude farinaceous food, not well fermented, their abdomen appears swelled and stuffed up with such undigestible food; they are costive, and waste with a slow continual fever, till at length they are carried off with a diarrhæa and dysentery.

When people have been obliged to use such an ill course of diet in besieged cities, the worst diseases have followed, as we said before in the comment to § 584; for such food does not only create disorders in the *primæ viæ*, but the crude chyle from thence prepared, renders the blood viscid and impervious, and therefore by increasing the resistance or obstructions about the smallest extremities of the arteries, it may create a fever, as is evident from what was said before at § 581, 582.

Or taken in such a quantity that they irritate, suffocate, obstruct, or putrefy.] For the ingested aliments may not only offend in their qualities, but also by the immoderate quantity which oppresses the stomach, and cannot be digested by the powers of the chylificative viscera. Hence, frequently children who have been admitted to great feasts or entertainments, are troubled with a fever, until their stomach is freed from the troublesome load either by vomiting or a diarrhæa. The variety and mixture of aliments, is likewise frequently the cause of the like maladies, the appetite being invited to load the stomach beyond its natural capacity,

city, by the agreeable taste and variety of the meats. Strong bodies using exercise, are hardly affected with great errors in diet; but people who are naturally inclined to weakness, or such as are recovering after diseases, are severely punished even for slight errors in diet, while their weak viscera are not capable of digesting a great quantity of food. Hence Hippocrates says ^w, *Hæc est autem ciborum offerendorum occasio, ut ea copia exhibeantur, quam corpus superare valet.* “But the call for foods to be administered is this, to exhibit them in such a quantity that they may be overcome by the body.” And in another place he says ^x, *Ubi nutrimentum præter naturam copiosius ingressum fuerit, id morbum facit.* “Where the nourishment is taken in greater quantity than nature can bear, it occasions disease.” In those afflicted with a pulmonary consumption, it is sufficiently evident, that too great a quantity even of the most salutary food, proves immediately hurtful, and rouses up a fever, or at least augments the fever that already attends. For if such take a large quantity of milk at once, immediately the slow fever, which continually preys upon them, is increased with great anxiety; but when they take it in small quantities at different times, they find it agrees very well.

For when a greater quantity of the food is taken than the body can bear even in healthy people, they are oppressed and troubled with loathings and sickness, till at length the stomach being irritated by the load, frees itself by vomit. It is a very dangerous disorder when the stomach is extremely distended by too great a quantity of aliments rarefied

^w De Locis in homine cap. 15. Charter. Tom. VII. pag. 374.
^x Aphor. 17. Sect. II. Charter. Tom. IX. pag. 54.

fied by heat and stagnation; for then both orifices of the stomach have been observed to contract themselves violently with a convulsive force, whence has followed intolerable anxiety, fruitless endeavours to vomit; and lastly, a fatal apoplexy, while the trunk of the descending aorta, being pressed by the distended stomach, urges blood too forcibly and in too great a quantity upon the encephalon, so that the vessels being extremely turgid, are sometimes burst. Add to this, that the aliments thus retained in the stomach and intestines in too great a quantity to be digested by the chylicative viscera, follow their own inclination to corrupt in the same manner as they would be changed spontaneously by standing in a warm and moist place, whence the most malignant putrefaction or depravity often ensues, more especially if the ingested food naturally inclines to putrefaction, as flesh, fish, eggs, &c. The truth of this is demonstrated by the vomiting of corrupt matter, and the most fetid diarrheas which so frequently follow after feasting and gluttony.

2.] We know, for certain, that the solid and fluid parts of the body are so altered by the motion of the humours and vessels, which is necessary to life and health, that they become unfit for those offices which must be sustained to continue life and health: but these vitiated parts are naturally expelled from the body, while at the same time others are prepared from the aliments by the efficacy of the vessels and viscera instead of those expelled. This excretion therefore of the parts, which by a too long retention have become offensive, is equally necessary as the taking in food itself to supply the waste thus made. Nor is this true only of those excretions which are naturally made every day, but also of such as more seldom hap-

happen, or which are only observed in diseases. Thus frequently do fevers arise from a retention of the menses, and from a suppression of the lochial discharges in lying-in women; and in those people who have had issues a long time in any part, or ulcers for some years, which daily discharge a considerable quantity of matter, it is often observed, that by suddenly healing them up, such are not only invaded with fevers, but also the most dangerous diseases. In the moist kind of herpes in infants, where there is a considerable quantity of humours discharged every day through the skin and cuticle, in this case wonderfully altered, if that discharge is suddenly suppressed without substituting other evacuations, they are immediately indisposed, and often killed by that means.

Those parts, which by too long a retention in the body become offensive, are in a state of health discharged chiefly by stool, urine, and perspiration; for though there are other excretions observed in the body, yet they serve not so much to depurate the mass of humours, as for the singular uses of particular parts; as for example, the mucus of the nose, the ear-wax, &c. for the tender surfaces of the olfactory membranes are first moistened and defended by this mucus, which, after becoming thick and dry, is evacuated or blown out. But these three evacuations, namely, by stool, urine, and perspiration, discharge such parts as according to the laws of health can be no longer retained within the body; and therefore these are the usual highways, one of which being obstructed, increases either the rest, and so that each may supply the place of the other. Hence Hippocrates^y tells us, *Cutis raritas, alvi densitas*. “ That
“ a copious perspiration denotes a constipation
“ of

^y Epidem. VI. Charter. Tom. IX. pag. 433.

“ of the bowels.” And in another place ², *Quod mictio noctu copiosa facta paucam dejectionem (per alvum) significet.* “ That a plentiful discharge by “ urine in the night, denotes a small evacuation “ by stool.” It appears, from daily observation, that the quantity of the urine is increased when the perspiration is diminished, and the reverse. Thus a person who sweats with hard labour in the summer-heats makes very little urine, though he takes in great plenty of drink. But although a defect in any of these excretions may be supplied by increasing the rest, yet the integrity of all is necessary to continue health: for each of these emunctories discharge some parts which cannot be evacuated by the rest, as the celebrated Gorter^a prudently observes in his most accomplished and elaborate treatise of perspiration. The matter therefore retained in the body by the obstruction of these emunctories, through which they ought naturally to be discharged, may create diseases, and particularly fevers. The urine retained in the bladder, becoming more acrimonious by stagnation and warmth of the parts, may, by distending and eroding the bladder, excite an inflammation and fever attended with the worst symptoms, as we are assured from numerous instances in the writers of medical observations. When the urine is not separated from the blood through some defect of the kidneys, or when after its separation, the passage through the ureters into the bladder is obstructed by a calculus, or any other cause, those acrid parts being retained, which used daily to be evacuated in the urine, will excite a fever, and will sooner or later bring on certain death, but usu-

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² Sect. IV. Aphor. ultimo. Charter. Tom. IX. pag. 191.^a Cap. 11. § 34. pag. 100.

ally affecting the brain first. A suppression of the intestinal discharge is indeed tolerable much longer, yet it is not without danger; and Hippocrates^b, long ago, tells us, a fever is to be thence feared; for he says, *Dejectiones alvi procedere oportet his, qui laboribus exercentur; quamdiu parum ederint, ac parum potaverint, paucas & duras; si vero tertio quoque die aut quarto, aut ex longiori intervallo prodierint, periculum est, aut febre, aut alvi profluvio corripiendos esse.* “That in those exercised with
 “labour, the evacuation by stool ought to be
 “small and hard, so long as they eat sparingly
 “and drink little; but if they are discharged only
 “every third or fourth day, or at longer intervals,
 “there is danger of their being taken with a fever or diarrhœa.”

But those two excretions made by urine and stool are not continually performed from the body, and the parts which ought to be expelled by these emunctories, are collected together in the cavity of the bladder, and the whole tract of the large intestines, by which means we may continue longer without these evacuations, and without any great detriment to our health. But the perspiration with which we are at this day acquainted, can never be interrupted and a state of health remain, although it is observed more plentiful at one time than at another; and therefore it is no wonder that the most frequent indispositions arise in our bodies, from an impediment of this excretion: and those causes which we have already considered under this aphorism, have a principal relation to this excretion.

That the whole body is perspirable was indeed known to the ancient physicians; but that the perspiration

^b Prædiction. Lib. II. Cap. 4. Charter. Tom. VIII. pag. 813.

piration only exceeds all the other evacuations taken together, and that a just proportion of this discharge is of the last moment, as well for the preservation of health as the cure of diseases, was first taught us and found out with great labour by Sanctorius, whose doctrine has been afterwards confirmed by Keil; and the discoveries of both these have again been collected, confirmed and improved by the celebrated Gorter, who has added most useful observations of his own, and has by a tedious course of experiments, discovered how far the aphorisms of Sanctorius, which he had formed from his observations in the air of Italy, are agreeable to those who inhabit our more northern climate. From the most faithful observations made by these authors, the reason will appear why the following are justly ranked among the causes of fevers.

Cold.] It was said before, in the comment to § 117, that the particles of our humours unite together by cold; and that the orifices of the smallest vessels opening in the surface of the skin, may be contracted by cold, no one can in the least doubt; and therefore both these effects of cold conspiring together, may obstruct the perspiration. Hence it is that the cold, especially admitted to the body while warm in bed, so often proves injurious by lessening the perspiration; and that a frequent agitation of the body in bed, while the summer heats are disagreeable, is by Sanctorius reckoned one of the most frequent causes of an obstructed perspiration, which is also confirmed by Keil and Gorter. From the observations made by the forementioned authors, we have the following general rule, “that the perspiration is less at that time, when the thermometer

“ indicates a greater cold^c.” But cold is above all the most prejudicial, when it suddenly follows after great heat; for thence often arise fatal pleurifies, when the body heated by labour is exposed to the cold air. Hence it is that Sanctorius carefully advises us in many places to avoid this pleasing, but deceitful cooling of the body. For the same reason also the diseases of autumn rage most when the cold mornings affect those unwary people, who being impatient of the heat at noon neglect to defend their bodies with sufficient cloathing. This admonition has been given us by Celsus^d, where he says, *Per autumnum vero, propter cæli varietatem, periculum maximum est. Itaque neque sine veste, neque sine calceamentis prodire oportet, &c.* “ But during autumn there is the greatest danger, because of the variation of the weather; and therefore one ought to go abroad neither without good cloathing nor without good shoes.”

Unctions.] It is highly probable that fat substances obstruct those small canals thro’ which the thinnest humours perspire, since it appears from experiment that those humours are watery: And for this reason in some people a slight anointing of the skin even with the mildest oil, excites an erysipelas, and often a fever. But these unctions seem to have been often used to lessen too great a waste in the humours this way. Unctions were used after warm bathing, that the moisture acquired in the bath might not be dissipated, and the bodies of the athletæ were also anointed to prevent sweating in excess, after which dust was sprinkled over them, that the limbs made slippery with the oil might be more firmly held by the wrestlers^e; from whence it

^c De Gorter de Perspirat. cap. 12. § 34. pag. 129.

^d Lib I. cap. 3. pag. 33.

^e Mercur. De Arte Gymnast. Lib. I. cap. 8. pag. 36, 37.

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it appears that unction with fat substances stops, or at least lessens the excretion which is made thro' the skin. But whether or no this is always of such bad consequence as to raise a fever, may be justly doubted, since this practice was familiar among the antients after bathing, and was used without any bad consequence by the very strong *athletæ*. The incomparable Reaumur^f found a method of prolonging the lives of insects by lessening their perspiration; and it is not without reason he believes the same thing may be tried in the human species: For in the cold countries, where people perspire less, we find more of the long livers than in the warm countries; and in winter, when the perspiration is much less, we see people live as well in health as in summer. Even though it cannot be denied, that many diseases arise from an obstructed perspiration; yet it has not been hitherto determined what quantity of perspiration is necessary to be made in every person to maintain health, since the other evacuations may help a diminished perspiration. It is probable that by being over careful to defend the body from the injuries of the air, we increase this perspiration beyond what is absolutely necessary. For we see plainly that people go almost naked^g as well in the hottest as in the coldest regions without any detriment; nor are they possibly troubled with any greater heat or cold than ourselves, as the whole body is in them hardened like unto the hands and face in us, which without injury we expose even to the severest cold. And how much custom may do in this case we are taught from tender girls, who expose many parts of their body to the air without injury, which

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^f Memoir. pour l'Histoire des Insect. Tom. II. pag. 48, &c.

^g Idem Tom. III. pref. pag. 1, 2.

could not be done even by the most hardy ploughman unaccustomed thereto.

Since therefore it is always dangerous to lessen suddenly the wonted perspiration, yet this might possibly be done by degrees without damage. Sudden alterations from heat to cold have been observed prejudicial by physicians in all ages; whereas people without injury bear the gradual changes of the seasons of the year, which are by degrees altered from the summer heats to the most severe winter's cold. Even an increased perspiration seems to weaken; and on the contrary a lessening of it strengthens the body. Thus we are all faint in very hot weather, and cannot perform the usual exercises without uneasiness, whereas in sharp cold weather the body seems light and active. It is evident that many people live perfectly in health, who perspire much less than ourselves. The most brutal race of men, the Hottentots who inhabit about the Cape of Good-Hope, do certainly lessen the perspiration by smearing their bodies all over with a mixture of fat and oil; and other nations in general cover the body quite over with a coloured varnish or paint. Travellers tell us^b that in Persia they varnish over the bodies of camels with pitch in the spring time when they shed their hair, that they may by that means be defended from the biting of flies. From all these instances therefore it is evident, that the insensible perspiration may be much diminished without detriment to health; and that it would seem to be a means of strengthening the body to reduce this discharge to a less quantity. Those who have been accustomed to sustain the injuries of the air from their youth, with only a slight covering to their

^b Idem Tom. II. pag. 53.

their bodies, lead a life healthy and strong; and on the other hand, those who have had their bodies too carefully defended from the cold, instantly perceive even slight alterations of the air, and are indisposed by the least uncovering of the body. I have visited many women, who being accustomed to load their heads with many coverings, have been violently afflicted with the head-ach, tooth-ach, &c. but by gradually exposing the head more and more to cold, and by washing every morning with cold water, they have afterwards lived free from those complaints. Perhaps this may be the reason why Hippocrates¹ says, *Qui probè perspirant imbecilliores, & salubriores existunt, & facile convalescunt. Qui malè perspirant, priusquam ægrotent, robustiores sunt. Quum vero in morbum inciderunt difficilior sanantur. Hæc autem & toti & parti—*

“ That they who perspire plentifully are weaker,
 “ more healthy, and easily recover. That they
 “ who perspire little become stronger before they
 “ are ill; but that when they labour under a dis-
 “ ease, they are more difficultly cured. But the
 “ former more easily and perfectly recover.” For
 so long as the perspiration is regularly carried on in people of a weak habit, they usually find themselves in perfect health; and as indeed the perspiration is apt to be obstructed in such people from very slight causes, yet it is easily restored, and such people more readily recover. But they who perspire less are generally more robust, and consequently are not liable to be indisposed from such slight causes; but when the natural strength of such people is overcome by the more violent causes of diseases, their illness is more dangerous, and their recovery more difficult. And

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hence

¹ De Alimento. Charter. Tom. VI. pag. 287.

hence in another place he observes; * *Corpora exercitata ac densa citius a pleuriticis & peripneumonicis morbis pereant, quam non exercitata.* "That strong and exercised bodies sooner perish by pleuritic and peripneumonic diseases, than such as are not used to labour or exercise."

Sorrowful passions of the mind.] This is observed by Sanctorius in several places of his statical aphorisms; and, on the contrary, that nothing more promotes a free perspiration than cheerfulness of mind¹. But he has moreover not only taught us that grief and fear obstruct the perspiration, but that the perspiration being once impeded from any cause, is followed with grief and fearfulness of mind. This is also confirmed by those signs in a person suddenly struck with fear, or affected with extreme grief; for such turn pale, grow cold, and are contracted throughout the whole body, the pulse is weak, and in fear it beats quick, but in those oppressed with extreme grief it is usually slow. Since therefore the powers, which ought to apply the humours to the secretory and excretory organs, are thus weakened, and at the same time all the signs denote that the smallest vessels of the skin are contracted in these affections, so as to resist more powerfully the humours to be expelled, it is sufficiently evident that the secretion and excretion of the perspirable matter must be lessened, or at least sometimes wholly intercepted for a short time; hence follows a return of the humours inward, attended with that severe anxiety or oppression of which the patient then complains, as if a great weight or press was acting upon the præcordia.

Meat,

* Coac. Prænot. No. 398. Charter. Tom. VIII. pag. 875.

¹ Vide No. 457, 458, 459, 460, &c.

Meat, drink.] In what manner meat and drink endowed with a great acrimony, as also things indigestible, and food taken in too great a quantity, may create a fever, has been explained a little before. But Sanctorius observes that the insensible perspiration is very much lessened by some certain meats or drinks. Pork, mushrooms, melons, and new raisins or figs, &c. he observed greatly diminished the perspiration^m; and the same he also remarks with regard to drinksⁿ.

Medicines.] Those of the milder kind indeed which hardly produce any disturbance in the body do not lessen perspiration, as Sanctorius^o observed of Cassia; but those which make a powerful evacuation, lessen the perspiration, as he observes^p.

Poisons.] For these much more powerfully disturb the body than medicines, and at the same time weaken the vital powers.

A damp foggy air.] Sometimes we observe such fogs as adhere to the walls and marble pavements, where being condensed they run down in streaks like oil; and sometimes at an unusual season of the year this is accompanied with great heat, and then all people complain of a sense of heaviness and weariness, which are the most certain signs of a diminished perspiration. Many people at that time also become peripneumonic, the perspiration of the lungs being checked by such an air. Sanctorius calls such an air foul or foggy, and justly remarks its effects, when he says^q, *In cænofo prohibetur perspiratio; meatus implentur, sed non densantur; fibræ laxantur, non roborantur, & pondus perspirabilis retenti lædit, & sentitur.* “ In

^m Sanctor. Aphor. 224, 225, 226, 228, 246.

266, 267, 268, 269.

53, 54, 57.

^o Aphor. 48.

^q Aphor. 147, 148.

ⁿ Aphor.

^p Aphor. 48.

“ In a foggy air perspiration is lessened, the pores
 “ are obstructed but not contracted, the fibres are
 “ relaxed not strengthened, and the weight of
 “ the retained perspirable matter is both sensible,
 “ and injurious to the body.” But that the perspiration is also lessened by a cold air, is observed to us by the same author; but then the weight of the perspirable matter retained is neither sensible nor injurious, because the pores are then contracted, and the fibres strengthened. But this foul or foggy air is generally accompanied with a southerly wind, which is confirmed by the observations of Hippocrates, who says, *‘ Austri vero corpora exsolvunt, & humectant, gravitatem capitis, auditum gravem, & vertigines faciunt in oculis, & in corporibus difficultatem ad motum, & alvos humectant.* “ But the
 “ south winds relax and moisten the bodies of people, bring colds in the head, difficulty of hearing, giddiness in the sight, and in the rest
 “ of the body an indisposition to motion, with a
 “ diarrhœa.” But he observes that the contrary of all these happen when the north wind blows.

Rest, or a neglect of wonted exercises.] How much exercise conduces to preserve health and strengthen the body, was said before in the comment to § 25. N°. 2. and § 28. N°. 2. and it there appeared, that the digestion and assimilation of the aliments into healthy humours were thus promoted, namely, by increasing the motion of the solids and fluids: But from the same causes proceed the excretions of those parts which would be injurious if any longer retained in the body; and therefore rest of body, or a neglect of wonted exercises, not only impedes the ultimate attenuation
 of

of the aliments, but also retards the expulsion of such parts as ought naturally to be discharged from the body, in order to maintain health. When a sense of weariness is perceived after sleep, which is a sign of a diminished perspiration, that complaint is removed by such things as facilitate that insensible discharge, as Sanctorius^s informs us, among which he reckons exercise: For by exercise he observes that the body becomes lighter, and the perspirable matter is prepared to be exhaled^t. But on the contrary, long rest renders sickly bodies heavier, because the meat and drink are not digested, and the excrementitious perspirable matter is not prepared to be discharged, from whence all manner of diseases, and often death itself follow as consequences^u. Even when perspiration is deficient in healthy people, he tells us it is restored by exercise^v. Hence Galen would not have even old people abstain from exercises, but orders them to keep up to their accustomed labours, only to lessen the violence of them^x. *Ignavia corpus hebetat, labor firmat, illa maturam senectutem, hic longam adolescentiam reddit*^y “Because idleness renders the body dull, but labour strengthens it; the first brings on old age betimes, but the last occasions a long youthfulness.”

Obstructions and compressions either from the contents of the vessels themselves, or from ambient bodies.] For since obstruction supposes (according to § 107.) an excess of bulk in the particles to be transmitted above the capacity of the transmitting vessels, it is very apparent that the excre-

^s Aphor. 374.

^t Aphor. 386.

^u Aphor. 389.

^w Aphor. 411.

^x De Sanitate tuenda Lib. V. cap. 3.

Charter. Tom. VI. pag. 144.

^y Cels. Lib. I. cap. 1.

pag. 20.

excretory ducts being obstructed, those parts will be retained which ought to be evacuated. But among the causes of obstruction (§ 112.) we reckoned those which by an external compressure diminished the capacity of the vessels, which must therefore have a place here. The passages for the urine and intestinal fæces which are so open, if compared with the smallest perspiring vessels, may yet be totally intercepted by tumours formed in the adjacent parts, as appears from the histories of diseases; and therefore it is no wonder if the perspiring vessels are compressed by ambient bodies endeavouring to take up a larger compass. When in ardent fevers the blood by an inflammatory tenacity stagnates impervious in the smallest arteries, these last being distended compress the adjacent secretory and excretory small ducts, and hence the whole external skin, tongue, internal parts of the mouth, fauces, &c. are invaded with a burning heat; and when the patient recovers from these dangerous diseases, almost the first time of nature's overcoming the disease is a return of moisture into all these parts.

3.] What great disturbances may arise in the body from great commotions of the mind (was said before in the comment to § 99. and § 104.) where they appeared to be a very powerful cause accelerating the circulation, which supposes a more frequent contraction of the heart, and consequently implies a fever (§ 573.) For even in the most healthy person a great affront offered, shall not only excite most severe anger, but also a fever, so that only changing the thoughts or ideas may disturb the whole body. Galen^z well observes in speaking of the affections of the mind, *Quod*
in

^z Method. med. Lib. XII. cap. 5. Charter. Tom. X. pag. 283.

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in illis omnibus ipsa per se ipsam moveatur anima.

“ That in all those passions the mind itself is moved and affected by itself.” For there is nothing corporeal capable of exciting such turbulent motions, since even the recollection of an injury formerly received, is able to renew those tumults which had been long ago quieted. But too much commotion of mind is more hurtful than too much motion of body, as Sanctorius ^a well observes, because the motion of the body may be allayed by sleep and rest, while that of the mind cannot.

But also violent motion of body long continued, especially in those unaccustomed to it, may excite fevers, and those even of the worst kind. In the comment to § 571. it was said that the venal blood was by muscular motion carried with a greater force and celerity towards the right side of the heart, which was by that means irritated into a quicker contraction, whence a true fever ensued, but soon vanished again if the cause was not violent; but sometimes this fever continues so long as to be of pernicious consequence, the truth of which is confirmed by many instances in the writers of observations. It may be sufficient for us to produce one instance of this from Hippocrates ^b. A young man lay ill of a fever in the Forum Mendesium from lassitudes, labour, and running beyond what he was used to, of which he perished on the seventh day: And here on the first day the urine was thin and dark coloured, the bowels disturbed, attended with watchings, and on the second day with a disturbance of the mind; but on the third day there was great anxiety, and the extremities of the body

^a Aphor. 494, 496. ^b Hippoc. Epidem. 3. ægroto octavo. Charter. Tom. IX. pag. 242.

body were cold and livid. From which history it is evident that an acute and fatal fever may arise only from excess in motion of the body, and that even accompanied from the beginning with the very worst symptoms.

Heat, &c.] Sultry heat of the air makes one of the most frequent causes of fevers, as appears from daily observation; for the most fluid parts of the blood being exhaled, the rest acquire an inflammatory density and tenacity, whereby its motion will be more resisted thro' the capillary arteries: But from this resistance readily follows a quicker contraction of the heart, that is a fever, as we demonstrated before in the comment to § 582. The very worst of fevers rage when the extreme heat of the air are accompanied with violent exercises of the body. Thus frequently being in the heat of the sun occasions a fatal frenzy, as we shall declare hereafter at § 772. Therefore Hippocrates * justly ranks among diseases of the summer continual and ardent fevers, with many tertians and quartans.

4.] In searching after the causes of fevers, we ought to attend to such things also as are externally applied to the body; for frequently the worst consequences arise from thence which are in vain sought after from other causes. A thorn fixed in some part of the body, especially such as is tendinous, has frequently excited a violent inflammation together with a fever. Cantharides applied to several parts of the body at one time, have thus also frequently produced a fever accompanied with extreme thirst, a strangury and bloody urine; on which account they are often so serviceable in languid and cold diseases. When an
unfor-

* Aphor. 21. Sect. III. Charter. Tom. IX. pag. 116.

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unfortunate girl anointed her head with butter mixed with arsenic, the most severe pains ensued, and the head was in vain washed with water; for there ensued watchings, a swelling of the whole head, fainting fits, a slight fever, delirium, &c. and on the sixth day she expired^d. What frightful maladies ending in a miserable death have ensued, when ignorant mountebanks have sprinkled a large quantity of corrosive sublimate on a plaster, and applied it to some external tumour which they would have break, may be seen in Degnerus^e. There are many more such observations which confirm the same thing; but these may suffice to prove, that a fever may ensue from the external application of acrid substances.

5.] The blood (as was said before at § 92, and the following) has some certain qualities by which it is distinguished from other known fluids; and it was likewise made evident in the comment to § 97, that the created fabric of the body formed blood in animals, which could not be imitated by any art hitherto known, nor do I believe it ever will be possible to make this imitation. But this sanguificative power is possessed not only by perfect animals; but also the tender growing stamen of the incipient chick does, in the first day of incubation in the egg, assisted by the heat of the sitting hen, form red blood out of the albumen, of which there was not before the least appearance. So long as the blood is moved through the vessels possessed of all its necessary qualities, the animal is in health; but so soon as it degenerates from its natural state, either by a mixture with foreign particles, or through some defect of the vessels
and

^d Wepfer. Cicut. Aquat. Hist. & noxæ, cap. 21. pag. 289.

^e Historia Medica de Dysenteria biliosa contagiosa, &c. pag. 234.

and viscera, all the functions will be disturbed, and a fever produced from the too quick action of the heart irritated by a vitiated blood. Thus in the most healthy people, after taking a more than usual quantity of food, there is observed a manifest acceleration of the pulse, as long as a great quantity of crude chyle flows thro' the vessels mixed with the blood; and hence weak people immediately are sensible of the least error in diet. When the blood so greatly degenerates from its natural crasis in the pale virgin, that fever is produced which physicians usually call white; because in these tender bodies the blood cannot be digested to its last degree of perfection; so that instead of good blood a foreign humour flows through the vessels.

But for blood to be formed of the indigested aliments, requires a due motion of the humours through the vessels; and the first appearance of red blood in the hatching egg appears in that point where there is a pulsation manifestly perceived; see the comment to § 97. and thus the chyle prepared from the indigested aliments circulates with the blood for many hours through the vessels, before it acquires the nature of that fluid. Every thing therefore which greatly alters this motion of the humours, may disturb the sanguification or conversion of them into blood, and cause them to degenerate more or less from their natural healthy state.

But very great is the number of those causes which may greatly alter the motion and nature of the humours, and some of them are so subtle as to appear only by their effects, and others which are no ways discoverable by the senses; as for example, the virus of the small-pox, plague, &c. we shall therefore enumerate the principal of these causes, (for to reckon up all of them would be difficult)

difficult) that by the knowledge of them one may be able to judge of the rest.

Hunger.] It was said before at § 80. that after the aliments have been reduced by the power of the body into such liquors as are usually found in healthy and robust people, they spontaneously incline to putrefaction, as well from rest as by too violent motion, after a person has abstained from all meat and drink for the space of twenty hours. Then it is that the sensation which we call hunger arises in a healthy person, to give notice that the body requires fresh aliment to restore those parts which have been destroyed by the actions of life and health. But when hunger has been sustained for a long time, the blood is not molified with sweet chyle prepared from the aliments, but all the humours become acrid and inclined to putrefaction, the breath then begins to stink, the urine becomes very sharp, and a fever with thirst arises from the increased acrimony of the blood and all the humours. This is evident in those who have had the œsophagus gradually streightened by a scirrhus tumour or some such other cause, till at length the passage into the stomach has been totally intercepted; concerning which lamentable disorder we shall treat more at large in the history of a quinsy; for such unfortunate patients are at last killed with hunger, the passage of all solid and fluid aliments being intercepted, are attended with a fever, and all the signs of the humours tending to putrefaction.

But how long hunger may be sustained without being destructive to life, has not as yet been accurately determined; Hippocrates ^f has told us, *Si quis velit septem diebus nihil comedere vel bibere, plurimi in his (diebus) moriuntur; quod si qui illos superaverint, tamen moriuntur, licet postea comedere*

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^f De Carnibus cap. 8. Charter. Tom. V. pag. 309.

Et bibere persuadeantur. “ That if any attempt to
 “ fast for seven days without eating or drinking,
 “ most of them die within that time ; but that
 “ even those who survive it do nevertheless die,
 “ altho’ they are afterwards persuaded to eat and
 “ drink.” But we read in the sacred scripture,
 that out of 276 people who fasted without food for
 the space of fourteen days, for fear of a shipwreck,
 not one of them perished ^a. An English woman is
 recorded to have lived only by the smell, without
 meat and drink, for the space of an entire year,
 tho’ kept under a perpetual guard by order of
 King Henry the eighth ^b; and we are likewise told
 of a Scotchman living thus for several months.
 Many more such histories are related by ^c Schenckius
 and the other writers of observations.

Evacuations.] It was said in the comment to § 25.
 that a due assimilation of the aliments required a
 large quantity of healthy humours present in the
 body, into which is poured only a small quan-
 tity of crude chyle prepared from the aliments;
 and that this is a law of nature we are taught from
 physiology. For the food taken into the stomach
 and intestines, there mixes with a large quantity of
 saliva, pancreatic juice, juice of the stomach, &c.
 and the chyle thence made is again diluted with a
 large quantity of lymph in the receptaculum chyli,
 and then it is mixed slowly or in a small quantity
 with the blood flowing through the subclavian vein.
 And hence again when too great a quantity of
 crude chyle is mixed with the blood of people who
 have taken too large a meal, a fever is thereby pro-
 duced, as we observed a little before. If now the
 quantity of our healthy innate humours is diminished
 by too large evacuations, the proportion of the crude
 chyle will be too great with respect to the concoct-
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^a Acta Apostol. cap. 27.
 Britan. pag. 131.

^b Joh. Cajus De Ephem.
^c Lib. III. pag. 321.

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ed healthy humours, whence the same effect will follow as before mentioned. Hence we frequently observe great weakness of body with an ill state of the juices after profuse hæmorrhages, from miscarriages, wounds, &c.

But when the humours separated from the blood, and thinner than the blood itself are too plentifully discharged out of the body, the rest of the mass is more disposed to run into concretions, by being deprived of what is most fluid, from whence may follow an inflammation which is always accompanied with a fever. Hence when the most fluid parts of the humours have been exhaled by the summer heats, autumnal fevers and inflammatory diseases are observed to be the most numerous and obstinate.

Matter.] It was observed in the comment to § 406. that when the best laudable pus or matter remains long confined in a close and warm place, it is by degrees attenuated, and changes into a worse nature, becoming ichorous and acrid; and that then being very easily absorbed by the mouths of the veins, it infects the whole mass of blood with a purulent cacochymy, which is always accompanied with a slow fever. This we are assured of by the hectic fever, which is continually wasting those who have an ulcer in the lungs, and which is never curable, unless the ulcerated part can be cleansed and healed; and this is true in whatever internal part of the body the ulcer or abscess may be seated. For a phthisis or consumption may as well arise from an ulcer in the kidney, as in the lungs. Hence Hippocrates ranks a fever among the signs of an empyema, as we shall declare hereafter.

Even when the whole skin abounds with matter in the small-pox, that being absorbed kindles a fever of the worst kind, which is often suddenly fatal, unless the matter is expelled from the body either spontaneously or by art, or else by a transla-

tion of it upon such parts as will allow the collected matter a safe exit to be procured.

Water or ichor in such as have a dropsy or an empyema.] An incipient dropsy does indeed often follow from fevers of long continuance, but is seldom or never of itself with a fever; for all the parts in this disorder are cold and languid. But an inveterate dropsy is usually accompanied with a fever, because the waters at length by standing begin to corrupt and putrefy, part of which being absorbed and mixed with the blood, by its stimulus excites a fever, and greatly increases the thirst. Moreover, as almost all the lymph escapes from the vessels in a dropsy, and is collected in the larger or smaller cavities of the body, the resistance of the blood, being thus deprived of its more fluid parts, is increased about the capillary vessels, while at the same time the heart is stimulated into quicker contractions by the putrid acrimony absorbed, whence a most ardent fever may be excited in this most cold disorder. Thus the legs of dropical people which were at first cold as marble, become afterwards so violently hot and inflamed, when the stagnant waters begin to corrupt, that frequently a gangrene of the worst kind ensues.

Sharp serum collected in any part.] It is frequently observed in scorbutick people that the legs break out with very painful ulcers, discharging a great quantity of acrid serum corroding the adjacent skin. If such ulcers are suddenly healed up by drying medicines, without first correcting the ill state of the humours, fevers and the worst consequences may follow. The same is also apparent in those who have been subject to discharge humours every day in issues; for the sudden drying up of those emissaries are attended with the like ill consequences. In the puncture of a nerve or tendon, there is usually a thin liquor collected about the wound,

wound, which sometimes not being able to escape through a small opening, spreads itself through all the adjacent panniculus adiposus, and in a little time acquires a malignant acrimony, whence arise the worst inflammations, sinuous ulcers, gangrenes, &c. which are then always accompanied with a fever. When the skin is eroded in infants by an acrid serum, especially in the head, it is dried up into thick scabs, under which the collected ichor corrupts in a little time, as is evident from the stinking smell, and makes deep erosions; and this acrid matter being absorbed, often creates malignant fevers, convulsions and death itself. I keep by me the parietal bones of an infant almost entirely eat through by this disorder, and which bones altho' they were cleansed, afforded the same stinking smell for several months, which had been before observed intolerable to every one, in the living infant.

Exalted bile.] When by any cause the bile, which is of all the natural humours of the body in its own nature the most acrid, is rendered still more acrimonious, it is then said to be exalted, because it excites such disturbances in the body, and frequently proves the cause of the most ardent fevers. That the bile is exalted by the summer heats, we are taught by constant observations from Hippocrates even to the present time, whence after very hot summers, autumnal bilious fevers are always found very common. But unless the corrupt bile is evacuated either spontaneously or by art in the beginning of these fevers, they usually hold the patient very long, and towards the end of the disease a diarrhæa or dysentery is excited by the putrid bile; which discharge the patient's strength being already extenuated by the preceding

disease, he is often not able to support, as we shall hereafter explain more at large, when we come to treat of vomitings in fevers. Hippocrates^{*} tells us that the body becomes more bilious by the summer heats¹, and that the bile put in motion is the cause of an ardent fever, and in several other places he says that the bile is the cause of most acute diseases. Accordingly I have known many people who have been once a month subject to a severe head-ach and fever, which having continued some hours they have discharged a great quantity of bile by vomiting, and have immediately found themselves well. A purge given once or twice in a month to evacuate this bile as soon as it begins to be collected, and before it is exalted, removes these complaints.

Inflammation.] This is evident from what was said in the comment to § 558.

Suppuration.] For this follows a preceding inflammation, and during the time while the suppuration is made, all the inflammatory symptoms are increased, as was observed at § 387. for a fever accompanies every inflammation, and will be therefore increased by a suppuration; whence Hippocrates observes to us, that the pains and fever happen more remarkably about the time of the formation of matter, than after the pus is formed; see the comment to § 158. N^o. 6. But even after an inflamed part has been converted into a ripe abscess, the matter being too long confined, attenuated and rendered acrimonious, may again produce a fever by returning into the blood, as we observed a little before.

Gangrene.]

^{*} De Salubri victus ratione textu 15. Charter. Tom. VI. pag. 228. ¹ De Affectionibus cap. 3. Charter. Tom. VII. pag. 622.

Gangrene.] For this is usually the consequence of a most violent inflammation; and a suppuration also follows in the margin of the inflamed part, while those parts corrupted by a gangrene, are separated from the adjacent living parts; to which add, that the gangrenous or corrupt matter being absorbed, often excites a very putrid fever.

Cancer.] From the immense pain, inflammation of the adjacent, and return of the very acrid sanies or foul matter into the blood, concerning which we treated before in the comment to § 499.

Overwatchings or want of sleep.] For by this means there is a great waste made of the most subtle humour in the body, which cannot be repaired but by sleep. Hence, after a person has been awake too long, all the functions of the body are weakened, and the concocting powers, by which the crude aliments ought to be changed into our own nature, are depraved, which gives rise to a train of the very worst diseases. Sanctorius^m observes to us, *Somno solito brevior semper aliquid perspirationis prohiberi: quod nisi sequentibus diebus plenior perspiratione compensetur, imminet febris periculum.* "That the sleep being shorter than
" usual, always hinders something of the perspira-
" tion, which, if not removed by a more copious
" perspiration in the following days, will be in dan-
" ger of exciting a fever." And in several other places he reckons up the ill effects of over-watching. But since the insensible perspiration is obstructed by keeping too long awake, and since we have largely demonstrated under the present aphorism, that fevers very frequently rise from that obstruction, it is therefore evident, that overwatching is deserv-

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edly ranked among the causes of fevers. Hippocrates ⁿ with his accustomed brevity tells us, *Somnus, vigilia, utraque modum si excefferint, malum.* "That sleep and vigilance are both of them injurious in excess."

Too intense study upon any thing.] This has almost the same effect with over-watching; for thus the most subtle parts of the blood are too much dissipated and consumed, whence a weariness and heaviness of the whole body follows, and often a greater weakness than after violent exercise of body: and this more especially happens while the mind is employed with all its thoughts fixed upon only one object, like as we read of Archimedes ^o, "Who in the midst of all the tumult that could be raised in a captive city by the rapacious soldiers, continued so intent upon his figures which he had described in the dust, that he was killed by a Soldier, ignorant who he was." *Qui in tanto tumultu, quantum capta urbs in discursu diripientium militum cedere poterat, intentus formis, quas in pulvere descripserat, ab ignaro milite quis esset, interfectus fuit.* Therefore study with a variation of the passions of the mind may be longer supported, as Sanctorius ^p tells us, than when there is no variation or change of the objects and passions. *Hinc antiquissimis temporibus medendi scientia sapientiæ pars habebatur, ut & morborum curatio, & rerum naturæ contemplatio sub iisdem auctoribus nata sit: scilicet his banc maxime requirentibus, qui corporum suorum robora inquieta cogitatione, nocturnaue vigilia minuerant ^q.* *Literarum enim disciplina majori studio agitata, ut animo præcipue*
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ⁿ Sect. II. Aphor. 3. Charter. Tom. IX. pag. 45. ^o Titul. i. Lib. XXV. cap. 31. ^p Aphor. 499, 500. ^q Celsus Præfat. pag. 2.

omnium necessaria, sic corpori inimica est *. “Hence
 “in the most antient times, the knowledge
 “of medicine was esteemed a part of philoso-
 “phy, and the cure of diseases, and the know-
 “ledge of natural things were first considered
 “or treated of by the same authors; namely, be-
 “cause those who studied nature, by weakening
 “their bodies with restless thoughts, and noctur-
 “nal contemplations, stood much in need of the
 “assurances of medicine. For the study of the
 “learned sciences, as they are attained with great-
 “er attention, and are more especially necessary
 “for the accomplishment of the mind, so are
 “they more inimical to the body, as Celsus ob-
 “serves to us.” Thus is there no state on all
 sides happy; for of all men those who give them-
 selves up to the study of wisdom might live the
 most happy, if they were not obnoxious to dis-
 eases from the same cause. Happy are they who
 can so conduct their life, as to join the healthy ex-
 ercises of body together with the improvements of
 mind.

Excess of venery.] How great an alteration
 is made in the body of the male, at the time when
 the semen begins to be formed and collected, ap-
 pears from common observation; for the rise and
 continuance of the beard and cloathing of the
 pubes depends thereupon, and a wonderful altera-
 tion appears both in the voice and passions of the
 mind; for the hitherto crying boy now becomes
 extremely bold, and often despises even real dan-
 gers. Nor is this observed only in mankind, but
 other animals also become extremely fierce about
 the same time. Even so great is the alteration of
 body

* Celsus Præfat. pag. 2.

body at that time, that Hippocrates * expects the cure of the most difficult diseases from puberty. No wonder therefore if the body is so much disturbed by excess of venery. The bull, a most fierce animal, when he sets upon the venereal act becomes afterwards languid: and those unhappy people, who have exhausted the vigour of the body by too early and immoderate venery, live enervated and subject to diseases: for a seldom use of this raises the faculties of the body, but too frequent depresses them, as Celsus † tells us. But he determines this frequently, not by number, but from the nature, age and habit of the body, and says, that it has not damaged the body when it is neither followed with weakness nor pain. Sanctorius ‡ observes, that the insensible perspiration is diminished, and the concoctive faculties weakened by excess of venery; and in several aphorisms which follow after, he reckons up the damages proceeding thence. It is therefore no wonder fevers, and those of the worst kind, should arise from the same cause. Hippocrates § gives us an account of two patients in fevers from drinking and excess of venery; one of which escaped not without difficulty, after a severe disease, extending to the twenty-fourth day, and the other expired at the same time of the disease. But in another place ¶ he relates more at large, the many disorders which are used to follow excess of venery, where he treats of a *tabes dorsalis*; in describing which disease he says, *Tabes dorsalis a medulla (spinali) oritur, maxime autem recens nuptos & libidinosos concipit.*

* Aphor. 7. Sect. 5. Charter. Tom. IX. pag. 197. † Lib. I. cap. 1.

‡ Aphor. 415, 416.

§ Epidem. 3.

¶ Egroto X. & XVI. Charter. Tom. IX. pag. 304, & 310.

* Hippocrat. De Morbis Lib. II. cap. 19. Charter. Tom. VII. pag. 571.

capit. Sine febre sunt, bene comedunt, & contabescunt. Quod si ita affectum perconteris, dicit, sibi videri ex superioribus partibus a capite velut formicas secundum spinam descendere; quumque urinam aut alvum reddit, prodit ipsi semen copiosum & liquidum, neque genitura intus concipitur, & in somnis, cum uxore dormiat, nec ne, semen profundit; quumque tum alias, tum præcipue per locum arduum iter fecerit, aut cucurrerit, anbelatio & debilitas ipsum prebendit, & capitis gravitas, & aures sonant. Hic temporis progressu vehementibus febribus correptus perit ex lipyria febre. “ That the ta-

“ bes dorsalis arises from the medulla spinalis, and
 “ mostly happens to those who are over leacherous
 “ or lately married. They are without fever, and
 “ eat heartily, but waste away. But if you ask
 “ him how he is affected, he answers, that there
 “ seems to him as if ants were creeping down the
 “ spine from the top of the head; a great quan-
 “ tity of liquid semen itself is also discharged
 “ when he goes to urine and stool, nor does he
 “ retain the semen in his sleep, but loses it whe-
 “ ther he sleeps with his wife or not. And when he
 “ travels or runs, especially through mountainous
 “ or difficult places, he is taken with great weak-
 “ ness and shortness of breath, a heaviness in the
 “ head, and a tinkling in the ears. Such a pati-
 “ ent in process of time, being taken with a vio-
 “ lent fever, perishes with a lipiria, wherein the
 “ internal parts burn with heat, and the external
 “ are cold,” All these complaints have I seen,
 and many more in these miserable patients who
 have indulged themselves with foul pollutions. I
 have observed wonderful pains wandering through-
 out the whole body, attended sometimes with
 troublesome heat, and sometimes with chilliness,
 and especially in the loins, which complaint con-
 tinued

tinued for three whole years inflexible to all remedies in a young man from the cause here mentioned.

After the pains above were lessened, he felt so great a coldness in his thighs and legs, that he was obliged to sit by the fire-side even in the midst of summer, though to the touch his body seemed to have the natural warmth. But what seemed most wonderful to me was, that during this time, the testicles were always moving and whirling about in the scrotum, and that the patient should perceive the same motion in his loins with a great sense of uneasiness.

We have now enumerated, and for the sake of method reduced into distinct classes, those causes which are observed to excite a fever: it now remains for us to consider those changes which happen in the human body from the fever itself, and which are termed the effects of the fever, since they follow from thence as the cause: concerning these therefore we shall treat in the aphorism next following.

S E C T. DLXXXVII.

THE effects of a fever are a quicker propulsion and expulsion of the humours, an agitation of those which stagnate, an intimate mixture of them altogether, an attenuation of those which resist the vital powers, a concoction, secretion of the matter concocted, a crisis, or a critical discharge of that which by a stimulus or coagulating force produced the fever; add to these an alteration in the humours from their healthy
to

to a diseased state, or else the introduction of such a change in the nature of the healthy solids and fluids, as will enable the patient to sustain things to which he has not been accustomed; and lastly, there follows an expulsion of the more fluid parts of the humours, and a thickening of those which remain; to which add, thirst, heat, pain, anxiety, weakness, weariness, heaviness, oppression and loathings, or aversion to food.

We now see what a fever is able to effect in the human body, so far as we consider it abstractly; for hitherto we have been only treating of a fever in general, supposing a healthy person to be taken with it. The first effect then will be.

A quicker propulsion and expulsion of the humours.] It is evident by what was said before at § 573, that a quicker contraction of the heart attends in every fever; but the heart cannot be more swiftly contracted, without expelling the blood contained in its cavities with a greater velocity, nor without propelling the same with a greater celerity through the arteries. For if the resistances in the arteries are so great as to prevent the blood from being thrown into them, the motion of the heart ceases, and death is present: but every fever not only supposes life present, but also is itself an affection of life endeavouring to avert death, as we demonstrated in the comment to § 573. In the cold fit of a fever indeed the blood often stagnates in the extremities of the vessels, (see § 577.) but even then the celerity of the blood's motion expelled from the heart, is increased through the larger vessels about the heart itself: for though in the cold fit the heart only expels a small quantity
of

of blood in each contraction, yet as it palpitates very swiftly, it moves what was expelled with a greater celerity.

An agitation of those which stagnate.] Some humours always stagnate even in health, in several parts of the body; and there are several uses which require a collection and improvement of certain humours separated from the blood into certain cells or cavities. Thus the cystic bile stagnates in a receptacle proper to itself, and the marrow is collected in the bones of quiescent animals, and the thick fat is collected in the adipose membrane, where it stagnates almost without motion; also in the mucous cryptæ of the stomach and intestines, there stagnates a thick humour, &c. But besides these diseases, there are often many humours collected and stagnant in the cavities of the body, which were before in motion. Thus the cavities of the abdomen, thorax, brain, pericardium, &c. in the living animal, are replenished with subtle vapours, which are every moment expelled from the smallest arterial ducts, and in the same proportion drank up again by the mouths of the absorbing veins opening into the same cavities; but when the animal is in a languishing condition, these vapours, being condensed and collected together, appear in the form of stagnant water, as we are taught by dropsies. But when the motion of the humours is increased by a fever, those which in health stagnated, are likewise put in motion, as appears from daily observations in practice. A fat person recovering after an acute continual fever, often loses half his weight, and the skin hangs loose in unsightly wrinkles on the abdomen, which but fourteen days before stood out to the distance of half a foot

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foot with fat. Hence Galen^y recommending violent exercises and heating medicines for the cure of corpulency, admonishes the physician to take notice that the patient thus treated will probably be seized with a fever, which yet will rather forward the intention, if every thing is rightly conducted. It is too well known with what disturbance the bile is often expelled both upward and downward in fevers; and frequently there are bilious vomits in every fit of a tertian; nor is this all, but the same bile, which stagnating before in its cyst, only distilled slowly into the duodenum, being now attenuated and exalted by the fever returning into the blood, tinges the urine and eyes of the patient, almost as in a jaundice. In the cure of a dropsy, physicians of all ages have made use of such medicines as are capable of exciting a fever in a healthy body, and this with a view to render the stagnant serum moveable, and to discharge it from the body. The antients made use of the boldest doses of hellebore, elaterium, spurge, &c. and the sharpest purgatives and vomits of the like nature are used as liberally by the moderns, the use of all which is ever accompanied or followed with a fever. The sharpest spices, pepper, garlic, ginger, &c. are again recommended for the same purpose by others; all which are still adapted to excite a fever, as is evident from what was said at § 586. N^o 1. The most tenacious atrabiliary feculences of the blood, which have lain sometimes for many years together without motion, are sometimes dissolved and put into motion by violent fevers, so as to produce the most dreadful maladies, as we shall declare more at large, at § 1104. The incorrigible matter of a scirrhus which has lain dormant for some

^y Method. Med. Lib. XIV. cap. 15. Charter. Tom. X. pag. 335, 336.

some years by rest of body, is often put into such a commotion by a fever arising from any cause, as to degenerate in a little time into a malignant cancer. From all these instances it is sufficiently apparent that an agitation or commotion of stagnant humours is here deservedly ranked among the effects of a fever.

[A mixture of them altogether.] For those humours which before stagnated, were separated and collected apart from the rest in the common Circulation. But when these, being moved by a fever, are absorbed by the veins and mixed with the blood, they pass on through the veins to the right ventricle of the heart, and from thence thro' the smallest extremities of the pulmonary arteries, they are conveyed by the veins to the left ventricle, by which they are again drove forward through the aorta. But it appears from physiology (or the structure and action of the parts explained in our Theoretical Lectures *) that each particle of the blood drove from the heart into an incurvated artery, is every moment of time acquiring a different direction, collision, rotation, &c. from whence must necessarily follow the most perfect mixture possible. Hence appears the reason why when so great a quantity of fat is mixed with the blood in a short time, while a corpulent person lies ill of a fever, it is all discharged from the body without any appearance, or at least very rarely, of real fat to be perceived in the discharged humours; the urine indeed appears very red, but the fat being intimately mixed with the salts, rendered more acrimonious by the fever, is reduced into a saponaceous nature, and the intestinal fæces also are extremely fætid, but never afford the appearances of real fat.

[An attenuation of those which resist.] This effect of a fever is of the greatest importance, and

* Herm. Boerh. Instit. Medic. § 220.

and from a neglect therein great errors are often committed in practice. For in such a manner is the machine of our body framed by the adorable Creator, that when any thing is applied, either as a stimulus or obstacle, to disturb the equable circulation of the humours, then either a new motion is excited in the body, or that already subsisting is increased. When too great a quantity of crude chyle is mixed with the blood from taking too great a meal, there is always a slight fever observed two or three hours after; and the same thing happens when the food is too difficult to digest, as we observed under the preceding aphorism. For since it is by the reciprocal action of the vessels upon the contained humours, and of the humours upon their containing vessels, that the chyle prepared from the food and mixed with the blood is gradually changed, so as to deposit its own nature and become blood; therefore the velocity of the motion of the humours through the vessels is thus increased, that the changing causes may be oftener and more powerfully applied in the same time to the greater quantity of more crude chyle, in order to make an attenuation of that which resists. When the blood stagnates in the extremities of the vessels during the cold fit of an intermitting fever, the resisting matter is attenuated or removed in that case by the fever itself, whereupon the fit terminates, and the equability of the circulation is restored. For this reason Sydenham^a observes to us, that it is dangerous to endeavour at once to remove the disease by the bark, while the fit is either present or at hand; for that then, by suffocating the motion which would remove the obstructions about the extremities of the vessels, one might destroy the patient, as it had been known by many instances;

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and

^a Sect. I. cap. 5. pag. 113.

and hence this incomparable and in itself salutary medicine has been disgraced, when the fatal event ought to have been justly ascribed to the misconduct of those who gave it. Hence we begin to perceive how a fever often performs the action of a medicine with respect to other diseases, as we shall afterwards explain at § 589.

A concoction.] When the ingested aliments are converted into our own nature by the efficacy of the vessels and viscera, so that they can restore the solid and fluid parts which are daily wasted by the actions of life and health, they are said to be concocted; for as we observed from Galen in the comment to § 25, *Concoctio est in coquentis substantiam deductio quædam ejus quod concoquitur*: “Concoction is a conversion of the concocted aliments into the substance of the parts which concoct or digest them.” But this is not the use and action of that concoction which is the effect of a fever. For when that, which by its stimulus or coagulum has produced a fever, is by the same fever so changed as to be less offensive and disposed to expulsion from the body; it is then said to be concocted, although it is not converted into the nature or substance of our healthy solid and fluid parts. When, for example, the impervious particles of the humours, wedged into the ultimate extremities of the arteries in inflammatory diseases of the breast, are so changed by a fever, that by the impetus of the blood urging behind, they are separated together with the extremities of the obstructed arteries, and changed into a white, smooth, uniform pus or matter, by spitting up which, these diseases are so frequently cured; we then say, there is a concoction made of the morbid matter, even though that matter can never be assimilated into healthy humours, but must of necessity

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necessity be expelled to restore health. Hence it is evident that the concoction of the aliments made in a state of health is very different from that which is made in diseases. We may therefore for distinction sake call a conversion of the ingested aliments into our own nature by the name (πέψις) concoction; and that change whereby the fever so alters its material cause as to render it less offensive and disposed for expulsion, may be termed πεπασμός, or maturation. Hence Galen^b observes that this maturation in diseases is a sort of concoction of what is preternatural, but that it is different from what we properly call concoction, which changes the aliments into our own substance; and in this place he makes use of the two forementioned words distinctly. Yet in other places he often uses the word πέψις, to signify that concoction or rather maturation which is made in diseases, as Gorreus^c very well observes: and in another place^d the same author very justly distinguishes betwixt these, when he says that, concoction is the preparation of things entering into the body, but πεπασμός, or maturation, is the preparation of things to be expelled or passing out of the body. Duretus^e likewise translates the word πέπασμα, a maturation or softening. Hence it is that Galen^f always seeks for the signs of concoction in diseases in the excreta, when he says, *Quod coctionis, quæ in spirandi instrumentis fit, sputa; ejus vero, quæ in venis fit, urinas; illius autem, quæ circa ventrem, alvi excrementa, signa statuere oporteat.* “ That the signs of con-

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coction

^b Comment. II. in Lib. I. Epidem. Charter. Tom. IX. pag. 55. ^c In Definit. Medic. pag. 509. ^d Ibidem.

pag. 501. ^e In Coac. Hippoc. pag. 9. ^f De Crisibus Lib. I. cap. 7. Charter. Tom. VIII. pag. 387. & Lib. III. De Crisibus cap. 3. ibid. p. 429.

“ coction happening in the organs of respiration,
 “ ought to be expected in the spittle; but of that
 “ which happens in the veins or arteries, in the
 “ urine; and of that which is made in the ab-
 “ domen, are to be expected in the fæces of the
 “ intestines.”

But that the fever itself is the cause of this maturation is allowed by the consent of the best physicians, and proved by repeated observations in diseases. Sydenham tells us in a place before cited (at § 558.) *Febris ipsa naturæ instrumentum est, quo partes impuras a puris secernat: hoc illa modo plane imperceptibili facit in principio atque etiam in æxum morbi, verum in ejusdem declinatione apertius, id quod ex urina cernere licet.* “ That the fever is
 “ an instrument of nature herself, whereby she
 “ separates the impure from the pure parts; and
 “ that this she does in a manner altogether im-
 “ perceptible in the beginning and in the height
 “ of the disease; but in the declination thereof
 “ she makes this separation more manifestly,
 “ which one may perceive in the urine.” Hence this great man placed the chief cure of fevers in keeping up the febrile motion to a just and moderate degree, lest becoming over violent it should destroy the tender vessels of the encephalon and lungs, or at least block them up with an impervious liquid; or on the other hand lest the febrile motion becoming too weak or dull, should render the concoction and attenuation of the morbid matter less perfect. Hence also he ingenuously confesses, that if the magnitude of the fever seemed sufficient to make a concoction of the morbid matter without threatening any danger, he did nothing himself in that case, but committed the whole business to nature. And in this he followed the steps of the great Hippocrates[§], who so frequently

§ De Articulis. Charter. Tom. XII. pag. 362:

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quently made himself only a spectator in diseases, as is evident from many parts of his Works, and as he expressly tells us himself, when in treating of the cure of a broken ear, he says, *interdum enim optima medicina est, medicinam non facere, & ad aurem & ad alia multa.* “ For sometimes the “ best medicine is to do nothing as well in a broken “ ear as upon many other occasions.” All this is confirmed by what has been said in the history of inflammation (§ 387.) for when the obstruction is so great as to be irresolvable, it can only go off by suppuration, during the performance whereof the fever, heat, pain, pulsation, &c. are increased, and by this means all the inflammatory and irresolvable matter, together with the obstructed ends of the vessels in which it is deposited, are concocted and changed into an uniform white and thick matter called pus. But when this maturation is impeded by a perverse treatment, an incurable scirrhus frequently remains ever after, incapable of being resolved or dispersed by all the endeavours of art, and can only be removed either by the knife or cautery.

A secretion of the matter concocted.] For as was said before, the matter concocted in fevers is rendered so mild as to be less capable of injuring and disturbing the actions of the body, than while it was crude; but in the mean time there is nevertheless often such qualities in the matter concocted, as will not permit it to be assimilated into healthy humours, and become obedient to the laws of an equable circulation. In such case then the concocted and matured parts are separated from the rest of the humours, and expelled either by urine, sweat, stool, &c. or else being collected together in some certain part, they form an abscess by metastasis or translation, as will be hereafter demonstrated in the several histories of acute, fe-

brile diseases. But this secretion of the concocted matter is made by the fever; and if it does not happen, a return of the fever is to be expected, as Sydenham^b, who calls this a depuration of the blood in diseases, learnt by a careful observation. For he observed in an acute continual fever, that about the fourteenth day, the matter which had been thereby concocted, was usually expelled in a moderate sweat: but that when the patient was too much weakened by purges, clysters, &c. though they might seem to give some relief at that time of the disease, yet for want of this discharge a new fever was kindled, taking perfectly the same course as the first, which had been suppressed indeed by weakening the patient's strength, but not cured; because the secretion and expulsion of the concocted matter had been hindered by a perverse method of cure.

A crisis or critical discharge of that which by its stimulus or coagulum produced the fever.] Crisis, literally signifying judgment, is derived ἀπὸ τῆς κρίσεως: it very frequently occurs among physicians in the history and cure of diseases, and therefore it will not be amiss for us to examine in this place what is commonly understood by it.

Galenⁱ would have only a sudden alteration of a disease towards health, to be simply intended by the word, because such a change always happens by manifest discharges or some remarkable abscess: but because this is usually preceded with a great disturbance in the body of the patient, and the disease often at that time displays itself with terrible symptoms, many of which are enumerated by Galen in the place mentioned, it is no wonder that those who attend upon the patient being at that time

^b Sect. I. cap. 4. 72, &c.
cap. 2. Charter. Tom. VIII. pag. 429.

ⁱ De Crisibus Lib. III.

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time much affrighted, should from the urgency of the case pronounce that a decisive judgment was then to be made of the patient's life; Galen would therefore have this term rather contrived by ignorant people than physicians; but then this sudden alteration towards a recovery of health is called a crisis only by way of eminence^k; for a change to sudden death he also calls a crisis, only with the addition of bad; and those disturbances which only make some considerable change, without entirely removing the disease, he calls imperfect crises.

It is not every change therefore of a disease into health which Galen calls a crisis, but only that which happens suddenly, and with some remarkable disturbance in the body preceding, or often attending; for thus Galen^l expresses himself in another place; *sæpius vero neque ulla crisis fit status tempore, sed paulatim solvitur morbus, longo tempore coctionem recipiens.* "But frequently
"there happens no crisis at the stated time, but
"the disease goes off gradually, taking up a long
"time in the concoction." And a little after he subjoins; *hujusmodi solutionem neque crisin nominino: si qua vero confertim fiat permutatio, & multo magis eam perturbationem, quæ illam præcedit, ita appello.* "Yet do I not call this kind of termination in the disease a crisis: but I call it so
"when it has been preceded with a sudden change
"and great disturbance." He would also^m have us to understand a crisis to take place in great diseases, but that slight diseases go off by resolution. Moreover, he would have us take noticeⁿ that al-

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ways

^k Ibid. cap. 1. pag. 428.

^l De Crisibus Lib. I. cap.

ultimo. Charter. Tom. VIII. pag. 406.

^m De Crisibus

Lib. III. cap. 4. Charter. Tom. VIII. pag. 433.

ⁿ Ibid. cap.

10. pag. 444.

ways something new or uncommon happens either in the breathing, hearing, sight, easiness of apprehension, &c. about the time when a crisis is to follow, all which he then calls critical signs or symptoms.

Nor does Galen ^o always call a termination of the disease in death a crisis; for he remarks, that patients frequently die in the beginning of the disease without a crisis, in great Inflammations of the principal parts, or through the great quantity, thickness and tenacity of the humours, which suddenly flow inward, and obstruct the course of the spirits; and sometimes that this happens in the height of the disease, when its force over-powers nature; and sometimes again, but rarely, in the decline of the disease, the vital strength being broke or exhausted. But he observes, that in these cases nature made no attempt to repulse the disease, being over-powered by its magnitude; but that if nature made such an attempt and failed, so as to excite any remarkable discharge or abscess with disturbance, then he calls it a crisis, but a bad one.

Galen also remarks ^p, that a crisis happens not in the beginning, but at the height of a disease, and is then always the best; but if it sometimes happens in the increase of the disease, it is then imperfect, and always at least less safe.

From all that has been said, it is evident that a crisis is supposed to attend in diseases, when great disturbances happen, and new symptoms suddenly appear; and when these are followed with a sudden alteration of the disease, either for better or worse: also that this change is followed or accompanied with considerable discharges, or else a de-
position

^o De Crisib. Lib. III. cap. 9. Charter. Tom. VIII. pag. 442.

^p Ibid. cap. 10. pag. 444.

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position of the humours into certain parts of the body, which is an abscess. For it was said before in the comment to § 402, that under the name of abscess, the antient physicians comprehended that endeavour of nature by which certain offensive parts were separated from the blood, and expelled out of the body, or deposited in some place; and therefore the antients distinguished two kinds of abscession, the one by efflux, and the other by translation or settling upon some parts.

But all the appearances which accompany a crisis, or which follow after, are included in that denomination. Hence they are frequently called critical perturbations or disturbances; and that which is expelled soon after the crisis, is called a critical discharge; as the matter settling upon some particular part, as well as before it is separated from the rest of the humours, is termed the critical matter, &c.

The most evident crisis therefore, and the greatest disturbances happen towards the height of the disease, or at its greatest increase, at which time there is a sort of equal and doubtful combat betwixt the vital powers and the morbid matter to be conquered, till nature over-powers the disease, or till she herself falls a victim thereunto; the former of which is termed a good crisis, and the latter a bad. But when after this struggle nature is neither totally triumphant over the disease, nor altogether subjected to it, the crises are termed imperfect.

Concerning these crises, Galen^a observes, *Si morbi in hoc tempore crisin non habuerunt, fieri non potest, ut in declinatione habeant: quicumque enim status tempus semel præterierint, hi sine crisi perseverant,*

^a De Crisib. Lib. III. cap. 5. Charter. Tom. VIII. pag. 436.

verant, & paulatim solvuntur. "That if the disease has not a critical turn at this time, that is, about the height, it cannot have it in the decline: for whatever diseases have once passed over the time of their height, such continue without a crisis, and are gradually resolved."

But that crises may happen at other times of the disease cannot be denied; and Galen himself affirms it, when he says, *Crisis omnibus diebus accidunt, sed neque pares numero, nec æquali fide.* "Crisis happen on all days, but are neither equally certain, nor kept to the same number." For on the seventh day of the disease, on which common acute fevers come to their height, he had seen so many crises happen, that he could not even number them, whereas he had seen more on the twelfth or sixteenth day. On the sixth day indeed he had observed crises, but such as were without the due signs, obscure, imperfect, or not to be relied on, and of ill consequence, or else accompanied with severe symptoms and the greatest danger. For after the disease has arrived to its height, it naturally declines by degrees; and on the contrary, the natural powers which remain in the patient, increase in proportion as the disease declines; whence those parts of the solids and fluids which were depraved by the violence of the disease, are gradually concocted and disposed for excretion, which in that case happens immediately after the decline of the disease, and is generally accompanied with less disturbances than when it is performed during the greatest violence of the disease. But a crisis is also properly said to attend when new symptoms arise, and the disease is either removed or diminished, according as the morbid matter is expelled either wholly or in part.

^r De Diebus Criticis Lib. I. cap. 2. Charter. Tom. VIII. pag. 452.

part. But the longer the disease continues before the crisis, so much the more is the violence of the critical perturbation lessened, as well as the quickness of the change: for those crises which happen in the height of diseases often terminate in a few hours time, and sometimes even sooner, being frequently followed with the most troublesome symptoms. Galen observes *, *Morbis autem inveterascentibus contingit, & judicia vehementiam perturbationis, & alterationis brevitatem, remittere, & ad duos sæpe dies vel tres extendi.* " But crises " happening when the diseases are grown old or " of long standing, are attended with vehement " perturbations, and the continuance of the alteration is lengthened, so that a crisis is often extended to two or three days."

Hence it is evident what the antients understood by the term crisis, although they have sometimes with less exactness, made use of the word to denote the solution of a disease, even without any apparent discharge or abscess. Thus Galen ' remarks, that Hippocrates, in the first and third book of his Epidemics, not only once or twice, but frequently calls the termination of the disease a crisis. Even Galen himself ", where he treats professedly of crises, has the following passage; *Sive subitam in morbo mutationem, sive ad meliorem statum inclinationem solam, sive perturbationem solam, quæ eas antecedit, sive omnem morbi solutionem, sive eam tantum, quæ bona sit, crisin quis velit appellare, non est mihi, nisi obiter, hoc in loco distinguere propositum; sed quo pacto hæc omnia quispiam optime prænoscat, percensere decrevi.* " Whether any one chuses to call by the term crisis a " sud-

* De Diebus criticis Lib. II. cap. 5. Charter. Tom. VIII. pag. 481. ' Ibid. pag. 482. " De Crisibus Lib. I. cap. 1, Charter. Tom. VIII. pag. 377.

“ sudden change in the disease, or an inclination
 “ of it only to a better state, or merely a distur-
 “ bance which precedes such a change, or an
 “ entire solution of the disease, or only that solu-
 “ tion which happily succeeds, is not my business
 “ in this place to distinguish, except cursorily;
 “ but by what means any one may well fore-know
 “ all these is the design of my enquiry.”

It has been frequently disputed, whether the maxims, which have been handed down to us by the antients concerning the crises of diseases, are observed to hold true in the diseases which occur in our days. Thus Hollerius * says, *Apud nos rarius incidere repentina illa & perturbationis plena judicia, quas ægiæ proprie appellant; sæpius autem exsolvi morbos alternantibus coctione & excretionibus.*

“ That among us, those sudden, full, and criti-
 “ cal perturbations rarely happen, which the an-
 “ tients properly call crises; but that diseases are
 “ oftener carried off by alternate excretions and
 “ concoction.” And this he believed to proceed from the difference of our climate or air, an intemperate way of living, or because the physicians more frequently weaken nature by bleeding and the exhibition of medicines; and to these he adds also, because it is customary with us to supply the patient with greater plenty of nourishment than what was usual with the antients. But although there seems to be some truth and reason in all this, yet it cannot be denied, that in our days crises are commonly observed in diseases, and that the knowledge of them is of the greatest use to the physician.

In the mean time, we must confess, that physicians do not always use that diligence in the ob-
 servation

* Comment. in Coac. Hippocrat. pag. 398.

ervation of diseases, which we find in the accounts given us by the antients. They carefully remarked each change which appeared every day of the disease, and by that means found out the manner in which nature cured diseases, following precisely in her footsteps. But who is there that will devote so much of their time to such a tedious observation in each disease? They who have the best opportunities of enquiring into this matter by an ample practice, are often oppressed with such numbers of the sick, that it is impossible for them to attend to every circumstance. There are also a great many physicians, who after making some observations, and not finding them agree immediately with what has been said on the crisis and critical days with their indices by the antients, they altogether neglect them for the future, and believe that at least in these climates they are of no use. Being very sensible of my own weakness, and therefore persuaded that my testimony can avail little in so weighty a matter; yet I believe I may venture to say what I have observed in diseases, with regard to the present subject.

In the treatment of acute diseases more especially, not trusting to my memory, I used to write down before the patient every thing that I could observe each day through the whole course of the disease, and after returning home it was my practice to reduce them into order. In this manner have I prepared for myself some hundreds of acute cases through every stage of the disease, remarking at the same time, what I had ordered the patient either in the way of diet or medicine. I was pleased with this labour, because I could by this means best discover the errors committed in the cure of diseases, and avoid them for the future: and also because I did not dare to call in the advice

vice of our great professor, which I so often found necessary, if I had not an accurate history of the disease. For the incomparable Boerhaave, who knew how to frequently excuse a stumbling scholar in more weighty matters, would yet resent with a severe countenance, a want of due attention in a matter which regarded life.

But when I afterwards compared the maxims of Hippocrates and Galen with what I had thus observed in diseases, I with great pleasure saw the truth of what they pronounced; and I perceived that the chief fault lay in our being so forward to make the antient physicians wiser, and presage more than they intended.

For crises do not happen in all diseases, nor are the critical perturbations always so violent as we have before mentioned to have been confirmed to us by the testimonies of the antients. This is also observed to us by a most weighty author in this matter, Sydenham^{*}: *Dari nempe quasdam febrium species, quas natura methodo sibi peculiari, sine visibili aliqua evacuatione ablegat, reducendo scilicet in sanguinis massam, illique assimilando materiam illam morbificam, quæ cum eo minus quadra- bat.* “Namely, that there are some kinds of
“fevers, which nature removes by ways pecu-
“liar to herself, without any visible evacuation,
“to wit, by returning the morbid matter into the
“mass of blood, and there assimilating whatever
“was foreign to the mass.” And he freely confesses, that he used no endeavours from art in the cure of these fevers, but only gave a very thin ale or malt drink, permitting in the mean time a free use of the air, and wonted exercises; and in this most simple manner, he recovered his children and most intimate friends, whence there could be no
sus-

^{*} Sect. V. cap. 2. pag. 284.

suspicion that a crisis did not follow from any impediment by art. The same author observed, that in those years, when autumnal intermittents were the most common, a continual fever occurred, in which nature so moderated all the symptoms, as to dispose the febrile matter prepared by a due concoction, to be discharged at its certain time; and this fever he called depuratory, being of opinion, that this was primarily a fever of nature, because it more frequently occurred than any others, and was more regular throughout the whole course of the disease. But with this fever he says, agreed those eminent and necessary rules delivered to us by Hippocrates and other antient physicians; and he also observes to us that these rules do not always answer in other kinds of fevers, which are of an unsettled and very different nature.

Besides this, death itself frequently follows in diseases without a crisis, as Galen^y observes, where he gives us the signs whereby the same may be fore-known in the following words; *Primum & maximum in morbis lethalibus signum, quod sine crisi mors est subsequutura, est virium imbecillitas: nam virtus ita prostrata ad pugnam contra morbum non excitatur. Secundum vero, si nullum adsit signum vel minimum coctionis; & præter hæc si morbus magnus sit & malignus, atque etiam celeriter moveatur: quum enim hæc adfuerint, mors sequetur omnino absque crisi.* “ The first and greatest sign in
 “ fatal diseases that death will follow without a
 “ crisis, is a weakness of the faculties or powers
 “ of the body; for the forces being thus damped,
 “ cannot be raised to fight against the disease.
 “ But the second is when no sign attends, even of
 “ the

^y De Crisibus Lib. III. cap. 10. Charter. Tom. VIII. pag. 443.

“ the least concoction, the disease itself being in
 “ the mean time great, malignant, and running
 “ on with celerity : For when these are present,
 “ death will follow without any crisis.

Many physicians also perceiving that fevers returned when the patient seemed well, and even after a manifest crisis; and finding others, which they had pronounced to be well, attacked a long time after with a dangerous disease, have been brought to despise and neglect all that relates to crises. But these disappointments have been already observed to us by the antients, who have also given us the signs by which these returns after crises may be predicted. For it frequently happens in more violent diseases that nature cannot conquer the disorder by one struggle; but after false hopes have been conceived the disease again breaks out, and cannot be entirely conquered, without by exciting new disturbances, the morbid matter which still remains in the body is expelled, and that frequently not by one but many emunctories. Hippocrates^z supplies us with a remarkable instance, proving all these particulars. A man lay ill of an acute and dangerous fever attended with terrible symptoms, livid frothy stools, a livid sediment in the urine, watchings, ravings, &c. on the ninth day he was taken with a shivering and sweat, but the delirium and many bad symptoms still continued. On the eleventh day he came to his senses, sweated and was free from the fever: But Hippocrates particularly adds that the urine was thin or clear at the time of the crisis, which he had always condemned in acute diseases, whence there was danger of the fever's returning, as it did on the fourteenth day; for
 after

^z Epidem. 3. Ægrot. 3. Charter. Tom. IX. pag. 222 —
 228.

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after being free two days the fever returned again with watchings and delirium. On the seventeenth day he had a sweat throughout his whole body, which relieved him, and he came more to his understanding; but still the fever continued with a thin urine and not well coloured: On the twentieth day he again sweated, was without the fever, but the urine was still thin; at length on the fortieth day he had a copious white phlegmatic discharge by stool, and much sweat flowing from his whole body made a perfect crisis.

I confess that when such cases as these occur'd to me in the cure of diseases, I was often doubtful, hardly knowing what to believe concerning the prediction of crises. I well remember that especially the following case, which I shall briefly relate, made me so over-bold that I was twice out in my prognostic in the same disease. In a healthy strong man afflicted with a pleurisy, after twice bleeding the violence of the disease abated; after this on the sixth day of the disease, having had a very troublesome night, he discharged an incredible quantity of urine, which immediately appeared turbid, and deposited a very copious sediment afterwards. The patient said that he not only voided this water easily, but with a sort of pleasure. The night following was sufficiently quiet, and I had predicted that this critical discharge by urine should carry off the disease. On the seventh day there was a profuse bleeding at the nose, the fever was much lessened, and now at least I thought the disease must be certainly conquered. But he complained next day of a sense of weakness in his loins, and was not altogether free from the fever. On the tenth day of the disease he felt something of an obtuse pain, and upon rising out of bed was lame in the right leg. On the eleventh day there was

a pain in the right groin, and although he could move his leg without any pain in the bed, yet upon raising up it was lame; but in other respects the fever was entirely off, and all the functions of the body in a healthy state. This made me predict an abscess near the joint of the hip; but on the twentieth day of the disease he discharged urine which looked turbid as soon as made, and deposited a great quantity of a white uniform sediment, whereby the pain of the part affected was immediately lessened; but two days after he had a clear limpid urine, whereupon the pain immediately returned, and went off again when the urine became thick and white. After I had collected together the observations which I had read in the ancient physicians, and disposed them in such order as to find them readily in each disease that occurred, I then began to compare with them the histories of diseases which I had before taken down, and I then saw what each sign denoted which had occurred to me in the present cases. For on the sixth day of the disease we are told in many places of Hippocrates and Galen, that a crisis very rarely or never happens, in the truth of which we may confide. Besides this, Hippocrates^a had remarked; *Quæ in morbis post crisin residua immorantur, recidivas facere solent.* “That
 “the reliques which are left in diseases after a
 “crisis usually cause returns.” But after this copious hæmorrhage or discharge of urine, there were still some remains of the fever accompanied with a sense of weakness in the loins, all which ought to have made me suspect that the disease was not yet perfectly conquered. Hippocrates^b indeed tells us, *Si ex morbis convalescentibus aliquid doluerit, illic abscessus fiunt.* “That if any
 “part

^a Aphor. 12. Sect. II. Charter. Tom. IX. pag. 50. & 2. 2. Epid. pag. 166. & 5. Epid. pag. 408. ^b Aphor. 32. Sect. IV. Charter. Tom. IX. pag. 153.

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“ part becomes painful in those who are recovering
 “ from diseases, they there make an abscess or
 “ translation of the morbid matter;” so that it
 was not without reason I feared an abscess at the
 joint of the hip : But in another place Hippocrates^c
 observes ; *Quibus spes est, ad articulos abscessum fore,*
eos abscessu liberat urina copiosa & crassa & alba red-
dita, &c. “ In those where there is reason to ex-
 “ pect an abscess will happen about the joints, a
 “ plentiful discharge of thick white urine frees
 “ such from the abscess, &c.” Thus I perceived
 myself out in prognosticating, because I did not well
 observe the practical rules of the antient physicians :
 For I ought to have predicted on the sixth day
 some relief, but not a total recovery from the dis-
 ease, and afterwards should have observed that
 there was danger of an abscess, but that there was
 reason to hope it might be prevented.

It is therefore best for the physician not to be too
 presumptuous in presaging future events in diseases,
 especially if he has not been long experienced in
 his profession, 'till use makes him more perfect,
 and his own mistakes more cautious. For we
 ought always to be mindful of the admonition which
 Hippocrates^d gives, namely, *Acutorum morborum*
non omnino certæ sunt prædictiones, neque mortis neque
sanitatis. “ That the predictions in acute diseases are
 “ not altogether certain either with respect to
 “ death or recovery.” But from this last apho-
 rism of Hippocrates some may object, that if no-
 thing absolutely certain can be concluded in the
 crises of diseases, what need is there to concern
 ourselves so much about that matter? Yet it is
 certain that the observation of crises is of the
 greatest use in diseases; for by that means we
 learn how and by what ways nature cures them,

K 2

and

^c Aphor. 74. Sect. IV. Charter. Tom. IX. pag. 184.

^d Aphor. 19. Sect. II. Charter. Tom. IX. pag. 59.

and we are admonished not to disturb her in that work by impertinent endeavours of art, as Hippocrates * prudently observes, where he says ; *Quæ judicantur, & quæ perfecte judicata sunt, neque movere, neque innovare oportet, nec medicamentis neque aliis irritamentis sed sinere.* “ Those methods of terminating diseases which have been
 “ or are about to be undertaken by nature, ought
 “ neither to be removed or altered either by medicines or any other irritating thing, but should
 “ be left entirely to nature herself.” For when by a careful observation we have learnt what course nature inclines to take, and by what passages to throw out the humours, we may forward those intentions by suitable remedies, endeavour to render the matter moveable, and prevent every thing that may oppose such a foreseen evacuation. Also from what the antients have delivered to us concerning crises and critical days, we may learn at what time of a disease those great alterations are to be expected ; and although from the weakness of human nature it will be impossible to be altogether free from error at some time in so great a variety of patients, yet as Celsus † justly observes ; *Non tamen, si quid vix millesimo in corpore aliquem decipit, id fidem non habet ; cum per innumerabiles homines respondeat :* “ We ought not therefore to reject
 “ or misbelieve what may deceive us perhaps hardly one time in a thousand, if it answers in numberless patients.” And the following sentence of the same author is likewise most true ; *Quod in vicino sæpe quædam notæ posite, non bonos, sed imperitos Medicos decipiant ; nec protinus crimen artis esse, si quod professoris sit.* “ That what
 “ often

* Aphor. 20. Sect. I. Charter. Tom. IX. pag. 36. † Lib. II. cap. 6. pag. 57. ‡ Ibidem.

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“ often seems about to happen by certain fixed
 “ signs, deceives not the good, but the unskilful
 “ physicians; nor is the fault to be immediately
 “ thrown upon the art when it belongs to the
 “ professor of it.” For it is not a slight care
 that will suffice for observing the progress of diseases, but a strict or scrupulous attention is required to every thing that happens therein. And in order from thence to form a just prognosis, it must be carefully observed at what time of the disease those sudden changes appear, as we shall declare when we come to treat of critical days at §. 741. to prevent our present discourse from running too great a length.

It is also to be observed, that all those endeavours of nature by which the attempts to concoct, prepare and critically discharge the morbid matter, may be disturbed by many things, either by the fault of the patient, physician, attendant, or some unavoidable accidents, which no human prudence could either foresee or avert; as for instance, when the patient is disturbed with sudden anger, or some other violent passion of the mind. Of all these particulars we are admonished by the most wise Hippocrates^b in his first aphorism, which tells us; *Vita brevis, ars longa, occasio praeceps, experientia periculosa. Oportet autem non solum Medicum exhibere se ipsum facientem, quæ decet; sed & ægrotum & adstantes, & externa.* “ That life
 “ is short, art long, accidents sudden, and experience dangerous. For it is not only necessary
 “ for the physician himself who takes care of the
 “ patient to do his duty, but also the patient, attendants, and other external things must con-
 “ cur.” As if he had told us (as Galen well observes in his commentary to this aphorism) that if any

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^b Charter. Tom. IX. pag. 1.

one would form a judgment concerning the truth of what was contained in the following aphorisms, he ought not only to prescribe what is convenient for the patient, but that the patient ought to be obedient, and the attendants faithfully execute his directions; also that external things which are almost infinite should be so managed as neither to disturb the patient's sleep, excite the passions of his mind, &c. For what disorders often arise from such disturbances is sufficiently apparent from daily observation, and from a remarkable instance in Hippocratesⁱ: For after having said, in describing the epidemical constitution which then prevailed, that such were chiefly preserved as had a considerable discharge of blood from the nose, or who had a great flux of urine with a laudable sediment, or else bilious griping stools or a dysentery; and having added that women and virgins with whom any one of these evacuations succeeded well, were always preserved and cured, yet he excepts one, the daughter of Philo, who perished, notwithstanding there was a pretty copious flux of blood from the nose, and that because she supped unseasonably on the seventh day. Thus Sydenham often severely complains that the patient's friends or attendants disturbed every thing so much by the hot regimen in acute diseases, though he had strictly forbid it, that a great many thereby perished, or at least were with great difficulty preserved from the jaws of death. Galen^k therefore justly condemns those physicians, who did not believe they had proceeded agreeable to art, if they had not thrown up a clyster, opened a vein, applied cupping-glasses, &c. and says that these always do mischief when they come near the patient; for
after

ⁱ Epidem. 1. Charter. Tom. IX. pag. 75. ^k De Diebus criticis Lib. I. cap. 11. Charter. Tom. VIII. pag. 468.

after so many errors being committed, it was altogether impossible for the motions of nature to happen at their stated periods.

But it seems very likely that those physicians, who always by their activity disturbed every thing, offended by their ignorance in not endeavouring to conduct all that they did, so as to avoid disturbing the usual efforts of nature for the removal of diseases. But even in the following ages there have been physicians of this stamp, who have gloried in doing this with design. Thus Helmont¹ severely exclaims against a crisis, and against the physicians who expected it in diseases: For says he; *Boni enim & fidelis Medici est negligere crises: præstaretque ægros medente caruisse, quotquot per crisin evadunt, multo magis quorum crisis tardior est.* “It is the part of a good and “faithful physician to neglect the crises; and it is “better for the physician who has the cure of “patients to be without a crisis, notwithstanding the number which may thereby escape; “and much more may this be said of a very slow “crisis.” And again in another place he says^m, *Bonus autem Medicus negligere crises debet, quia anticipare. Nam natura crisin non facit, nisi dum sola totum onus bajulat, statis diebus. Verus ergo Medicus, ante crisin, morbum superare debet, ideoque nec crisin expectat, nec optat, &c.* “That a “good physician ought to neglect crises, because “they anticipate his work. For nature does not “make a crisis on stated days, unless she carries “the whole burden herself. A good physician “therefore ought to conquer the disease before a “crisis, rather than expect or wish for one, &c.”

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¹In Capitulo De Tempore pag. 509. N°. 52. &c. ^mDe Febribus cap. 11. circa finem pag. 772. N°. 27. &c.

He tells us that in his younger days he wrote five books concerning crises, which he afterwards committed to the flames". But he would not even believe that disease opposed nature, and therefore he concluded that the name crisis was improperly assumed by the schools, since it followed without strife or decision; *Crisis ergo, ut iudicium, sonet, esto iudex & accusatrix medentium, & bajulantis solius naturæ testimonium.* "For a crisis," says he, as the word imports judgment, is there-fore both the judge and accuser of physicians, "and only a testimony of loaded nature." For he boasted that it was in his power to suppress diseases at their first rise, before they have made any considerable advance; and he proclaims those unworthy the name of a physician who could not effect the same thing.

But it is as easy to promise many and great things as it is difficult to perform them, and there are always such deceits used by boasters in crying up their arcana, by which alone they can do miracles, but dare not divulge them because of the malice and ingratitude of men. But until such pretenders can shew themselves able by experiment to effect what their own works confute, they will be deservedly despised by every one.

It is indeed true, that many of the most dangerous diseases arise from most subtle miasmata communicated to the body, and only appearing to us by their effects; whence it would seem that if any one could expel the contagious matter from the body, or render it so unactive, as to excite no disturbance, he might then instantly cure the disease, and prevent all those ill effects which would otherwise follow. Thus he that could instantly correct the infection of the small-pox, as soon as it

it is taken into the body might prevent the eruption, suppuration, and all the other symptoms that thence follow. But so long as such an antidote to this poison is unknown, nothing remains for us but to attend carefully to the manner how, and the ways by which nature separates and expels the received poison and corrupted humours out of the body, together with the remedies by which these may be promoted, how the disturbances which often arise in these actions may be allayed, in what manner nature, often oppressed and languishing under the violence of the disease, may be supported and raised, &c. For we are certain that physic arose from a faithful observation of diseases, and will ever be most promoted thereby.

But although the ancient physicians have left us many excellent rules whereby we may discover the method, ways and times in which nature cures diseases; yet we might reasonably hope to enlarge and make them more perfect, if we make use of the same diligence in the observation of diseases.

Nor yet are we to despise what is handed down to us by the ancients concerning diseases, because they were ignorant of the circulation of the blood, and many other beautiful discoveries since made; for they endeavoured to know and cure diseases not by understanding their causes, but by a faithful observations of their effects. And even at the present day, though our age is happily supplied with an opportunity of using all the new discoveries, yet are we very far from being able to understand diseases and their effects (*à priori*) from their causes. Hence it happens that when physicians endeavour to establish general rules from a few known principles, they have only advanced showy hypotheses, which have in a little time fallen to the ground; and have therefore deserted the com-

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mon road of the ancients, to the great damage of
the salutary art.

Even the beautiful discoveries and remarks which have been made in the cure of the most intricate diseases by the worthy Sydenham, ought to inspire the minds of every one, since without the help of theories, he by a diligent observation has collected all the appearances of the diseases yet known to us, so as to form a most exact history of them, from whence naturally followed the just indications, which he so successfully pursued in the cure of those diseases; and at the same time his accurate history of diseases pointed out what might be feared or hoped for at different times of them, whence he derived a most certain prognosis.

There has been very lately published a treatise containing many instances that teach us how well the observations handed down to us by the ancients concerning crises might be increased to advantage, by carefully attending to the disease throughout its whole course. Franciscus Solano de Luque, a Spanish Physician, though little versed in physical learning, has yet been able only by a careful observation of the pulse in diseases to predict various critical evacuations by urine, stool, sweat, bleeding at the nose, &c. and frequently even to determine the hour when these crises were to be expected, to the great surprise of every one. This physician has published a pretty large volume concerning these matters, which he entitles *Lapis Lydius a Pollinis*, &c. in which with great candor he describes those changes of the pulse which he had observed to precede those crises, and at the same time confirms the wonderful predictions which he had made and proved true in diseases, by such testimonies as leaves no opportunity to doubt of the truth of the history; for there are not only the most eminent citizens, but likewise many physicians

ficians his witnesses, living in the same city with himself, and many of them too which were of a very different opinion when they met together in consultation with him, who yet have been so candid as to confirm upon oath, that they had been deceived, and that the prognostics given by the author had proved true in the event. But as this treatise was written in the Spanish tongue, and abounded with many things little appertaining to the main design in view, therefore the learned Dr. James Nihell^o extracted the principal matters, collected them together, and added observations of his own and others, whereby the critical rules of the said Spanish physician are confirmed, and sometimes limited, when he had lain them down too general. This ingenious physician taken with the novelty of the thing travelled to Antequera, where Solano dwelt, and conversed with him for the space of two months; likewise consulted the witnesses nominated in his treatise, who all confirmed the truth of the account. But what is more, the author confirmed the truth of his predictions to him by practice on his patients, &c. the particulars of all which are methodically related in this entertaining treatise. The importance of the thing indeed is such that it ought to be enquired into by all who are employed in the practice of physic: nor does it seem improbable but that more such signs may be discovered in the respiration, urine, tongue, &c. at least these ought to excite a careful attention to every thing which happens in the course of diseases; for thus, as Galen observes, *Generosus aliquis, & veri amator, & qui labores in pulcherrimis non refugit, neque theore-*
matum

* New and extraordinary Observations concerning the Prediction of various Crises by the Pulse, &c. by James Nihell. London, 1741.

matum difficultatem, neque temporis prolixitatem, neque exercitii laborem veritus, ad commemoratorum perfectionem veniet; ut non solum diem firmiter possit prædicere, sed etiam horam ipsam, in qua ægrorum quemquam judicari, vel mori necessarium est.

“ One free from prejudice and a lover of truth,
 “ ready to undertake every thing laborious for its
 “ usefulness, and who is not affrighted either by
 “ the difficulty of the theorems, the length of
 “ time, nor the labour of the exercise, may
 “ arrive to the desired perfection; so as not only
 “ to be able to predict certainly the day, but also
 “ the hour itself, in which each patient must
 “ of necessity either die or recover ^p. ”

An alteration of the healthy humours to a diseased state.] While the sound humours flow freely through the pervious vessels with a due impetus in a healthy person, all the functions of the body are most justly performed, *i. e.* health is maintained; but when the motion of the humours through the vessels is increased in a fever, those qualities which are required in the healthy humours are sooner or later changed, and degenerate more or less according to the different nature, violence, and continuance of the fever. When a fever is excited in the most healthy body by the stimulating poison of the small-pox, a great part of the humours is in a few days time converted into matter, or else, in the worst species of the disease, into a gangrenous ichor. From too violent exercise of body in the summer heats, often arises a most ardent fever, which so changes all the humours as to disturb every function, so that in three days after there is scarce any thing of health remains. Nor will this seem wonderful if we consider what was
 said

^p Galen. De Dieb. Crit. Lib. I. cap. 10. Charter. Tom. VIII. pag. 470.

said before (in the comment to § 100.) on the effects of an increased motion of the blood with respect to the solid and fluid parts of the body. For thus the urine often becomes extremely sharp, and in a measure putrid, as it washes off the salts and oils of the blood, rendered more volatile and acrid by the increased motion; the saliva is viscid and of a putrid taste, and the intestinal fæces are often very fluid, and of a cadaverous smell; the bile is converted into a most putrid liquor, &c. the blood in the mean time exhaling its most fluid parts acquires an inflammatory thickness, or sometimes being invaded with a putrefaction, the whole mass of it is dissolved. But when these depravations of the humours are observed in bodies dead of a fever, they are often falsely accused of being the cause of the fever, when in reality they are only its effects. Thus critical evacuations have more especially this use, that they expel from the body those parts which have degenerated into a diseased state by the fever.

The introduction of a new change in the healthy solids and fluids, &c.] We observed before in the comment to § 558, from Sydenham, that people who have suffered any considerable and sudden alteration in the six nonnaturals, are usually taken with a fever, by which they become afterwards more capable of supporting what they could not sustain before without detriment to their health; and hence he takes occasion to say¹, that when a fever arises from this cause, the new things grind or attenuate the blood. But this is confirmed by frequent observation, more especially in those who go into foreign countries. Also in many diseases which are accompanied with a fever, we see the bodies of people are so altered, that they

¹ Sect. I. cap. 4. pag. 61.

they afterwards sustain the same causes without damage, though frequently applied, from whence they were first disordered. Thus a person who has once had the true small-pox is not infected again, though he every day converses afterwards with those who lie ill of the disease. Thucydides^r, describing the terrible plague of Athens, remarks, that those who escaped after being invaded with this infection, lived for the future free from the pestilence. Yet the observations of the more modern authors who have wrote upon the plague, teach us that people are often seized again with the same pestilence, and that many who have once escaped, have been afterwards infected again. During the pestilence, which about thirty years past raged almost throughout Europe among the cattle of the oxen kind, the country-men in these parts would give almost any price for cows that had once had the disease, because they never or very rarely were again seized with the plague. Thus also Sydenham^s remarks, and I have frequently observed it myself, *Quod cujuscunque demum ætatis aut temperamenti fuerit is, qui quartana corripitur, si quolibet alio vitæ tempore (vel etiam ab hoc remotissimo) eadem semel laboraverit, non diu admodum eum secunda hac vice fatigabit morbus, sed post paucos aliquot paroxysmos sponte solvetur.* “ That whatever age
 “ or temperature the patient is of who is taken
 “ with a quartan, if he was ever afflicted with it
 “ before in the former part of his life, however
 “ remote it may be from the present time, the
 “ disease will not fatigue him long the second
 “ time, but will go off spontaneously after a few
 “ fits.”

An expulsion of the more fluid parts, and a thickening of the rest.] It was demonstrated in the

^r De Bello Peloponnesiaco Lib. II.
 pag. 102.

^s Sect. I. cap. 5.

the comment to § 100. that by the increase of the motion of the circulation which attends in every fever, the watery and thinnest part of the humours are exhaled or carried off, and that from this loss the rest are thickened, which might be the cause of the very worst obstructions. Hence those who have been subject to profuse sweats in each fit of an intermitting fever, are often afflicted afterwards with the most stubborn obstructions in the abdominal viscera. For this reason Sydenham was so solicitous to prevent sweats arising, as well in the beginning of the small-pox from a hot regimen, or too great a weight of bed-cloaths, as in the beginning of other acute diseases; for by that means the blood being deprived of its diluting vehicle became disposed to stagnate in the smallest extremities of the vessels; whence he observed that the worst inflammations, phrenzies, purple spots, and the like malignant symptoms often followed. Hence also Hippocrates tells us, that those who die of an ardent fever perish by driness (see the comment to § 100.) for we see that in such patients before death the tongue and fauces are extremely dry, the whole skin feels rough and parched, the eyes look with a dusty driness, and the whole body in every part both external and internal seems withered and juiceless, as we are taught from the dissection of the dead bodies.

Nor is it any objection to this, that dropsies sometimes follow after continual fevers, and that the whole body swells with a watery defluxion. For in these cases indeed the fever expelled the thin humours from the body, but such as were assimilated or concocted; but great quantities of crude drinks being taken in to allay the thirst that generally attends, which the strength of the body weakened by long fevers is neither able to move nor expel, they stagnate, and are collected in the larger or smaller cavities.

But

But from what has been hitherto said, the reason of those symptoms will easily appear which follow in the text; and concerning which I shall therefore speak more briefly, because we shall treat of most of them hereafter under their particular titles.

Thirst.] For this follows from a driness and imperviousness of the humours, as we shall explain hereafter at § 636. because when the most fluid parts of the humours have been dissipated as before mentioned by a fever, what remain are inspissated. Moreover, as by a fever the healthy juices acquire a morbid disposition, and often degenerate into a greater acrimony, as we have already demonstrated; from thence again we have another reason why thirst ought to be reckoned among the effects of a fever.

Heat.] It was demonstrated in the comment to § 100. that an increase of the circulatory motion renders the mutual attrition betwixt the blood and the vessels more violent, and therefore a greater heat must follow, concerning which we shall speak more largely when we treat particularly of heat in fevers at § 673.

Pain.] Which arises either from a distraction of the vessels distended by impervious juices, and in the mean time stretched by a greater impulse urging behind; or else from a change in the healthy nature of the humours degenerating from their mild into an acrid state, so as to injure and irritate the sensible nervous parts (see § 220.) Thus when the bile is rendered more acrimonious in a fever, and lodges about the præcordia, a most severe head-ach attends, which is immediately relieved upon the removal or discharge of the bilious matter.

Anxiety.] For this is caused (as we shall explain hereafter at § 631.) by impeding the egress
of

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of the blood from the heart, whether the impeding obstacle be lodged in the extremities of the pulmonary artery; or those of the aorta. It is to be also observed that this troublesome sense of anxiety or oppression is perceived, when the blood cannot pass through the narrow extremities of the *venæ portæ*. But we have demonstrated that in fevers the most fluid parts of the blood are often expressed, and the rest inspissated, so that hence the impervious humours are incapable of passing thro' the ultimate extremities of the fore-mentioned vessels. The same effect may be also produced by a contraction, or too great a narrowness of the vessels themselves, through which the free passage of the humours is obstructed. Hence in the cold fit of intermitting fevers, the greatest sense of anxiety or oppression is often perceived.

Weakness.] For this arises (as will appear at § 661.) either from a defect in the quantity, or from the imperviousness of the humours, or else from an obstruction of the canals through which the humours flow. But it is evident that all these bad accidents may follow from a fever, and consequently they may produce a weakness. Thus we often observe in the beginning of fevers of the worst kind, that all the strength of the body is immediately exhausted, which is indeed always a bad sign; because it denotes the greatest malignity of the disease.

Weariness or lassitude.] Which is said to attend when the voluntary motions cannot be performed without a sense of uneasiness, numbness, and sometimes a sort of obtuse pain, like what happens in healthy people tired with too much exercise, especially such as they have not been used to. This troublesome sense of lassitude arises from too

great a waste of the most subtle fluid required in the motion of the muscles, and from a too violent or long continued agitation of the parts of the body. But in fevers the most fluid humours are often expelled, while in the mean time many of the functions being injured, the loss cannot be quickly supplied from the nourishment taken in, whence a deficiency in the spirits must follow. This is much increased by those restless agitations in bed, and the uneasy trembling of the body, which usually accompanies the cold fit of intermitting fevers, whereby all the limbs are violently shook.

Heaviness or oppression.] So long as there is a free motion of the humours through all the vessels, a person is active, in perfect health, and does not perceive the weight of his own body; but so soon as any impediment arises to the free circulation of the humours, immediately a sense of heaviness is perceived either throughout the whole body, or at least in the part affected. As for example, a person who has a violent phlegmon seated in one arm, will feel it heavy almost like lead. It was known and observed by Diocles, who from the greatness of his skill acquired among the Athenians the name of Hippocrates the younger, that the nature of animals consisted in a virtue or power sustaining the body, and in the body itself sustained by that power^t. Hence so soon as that sustaining power is weakened, the body cannot be supported without difficulty and uneasiness. But this virtue sustaining the body depends on a free influx of spirits and arterial blood into the muscles, and therefore supposes the circulation perfectly free, which yet appears to be disturbed in fevers in the manner

^t Holler. Comment. in Coac. Hippocr. pag. 405. & 941.

manner before explained. And therefore Hippocrates^u so much condemns it as a bad sign in diseases for the arms or legs, or the rest of the body to seem heavy; and on the contrary esteems it one of the best signs when the patient can turn himself easily in the bed, and finds himself chearful or inclined to action upon rising up.

Loathings or aversion to food.] When there is a deficiency of those causes which are required to be present in the healthy animal for the digestion of the aliments, the appetite is either entirely lost, or much impaired. But towards a good digestion many causes are required to concur, and among those more especially the juice of the stomach, intestines, pancreas, and both kinds of bile are required to be well conditioned. But it has been made evident that by fevers the humours are often changed to a morbid disposition, and that above all the bile most frequently and soonest degenerates in fevers, whence it is that we so frequently observe bilious vomitings, diarrhæas, bitter ructus's and intolerable tastes in the mouth, &c. and then the appetite is always destroyed at the same time. Sometimes indeed it happens, but rarely, that hunger attends in the fits of an intermitting fever; yet generally when a fever is present, the appetite is abolished, or at least greatly weakened.

^u In Prognost. Charter. Tom. VIII. pag. 623, 624.

S E C T. DLXXXVIII.

THE sooner the lentor or stagnation of the blood in the capillaries can be removed (§ 577,) and the less time there is required to allay the irritation of the heart (§ 574.) so much lighter, shorter, and more salutary will be the fever, and the reverse. The fever will therefore vary in proportion to the different degree and concurrence of both these.

We have under the preceding aphorism taken a view of the bad effects to be feared from a fever, and from whence we may form a judgment of what good may be expected therefrom, and what general prognosis is to be formed in fevers. We come now to consider those from whence we may presage the magnitude, duration and event of a fever.

It was said at § 577. that the humours stagnated in the extremities of the vessels in the beginning of every fever, and at the same time there was a cause irritating the heart. This obstruction or stagnation formed in the extremities of the small vessels impeding the free course of the blood through them, is here understood by the general term lentor, from whatever cause it may proceed, either from a fault in the humours, vessels, or both together. If now this lentor by the increasing force of the circulation in the heat of a fever can be easily resolved, and at the same time if the cause irritating the heart is such as will either speedily cease of its own accord, or may be easily conquered

ed by the fever itself, it will be then both of a short duration and salutiferous. This will better appear by example: if a fever arises from too much exercise of body, and the blood in the mean time does not acquire an inflammatory thickness, such a fever will be cured in a little time by rest, diluents and a thin diet. For the irritating cause in this case is chiefly the venal blood urged with a greater celerity and impetus towards the heart; but by rest of body this irritation soon goes off. But a lentor of the blood occasioned by too great a loss of the more fluid parts in sweats, and from a greater condensation of the blood, by the increased action of the vessels upon their contained fluids, is easily resolved by restoring to the blood with diluent drinks what it had lost; and by rest of body the motion of the humour becomes more sedate. But when by over exercise of body the blood has acquired an inflammatory tenacity, or if this quality pre-existed in the blood before the body was exercised with a violent motion, the lentor in such a fever cannot be so soon resolved, but it will continue longer and be more dangerous, because of the inflammation and other bad symptoms which may be thence feared. Hence appears the reason why Hippocrates * says; *Corpora exercitata ac densa citius a pleuriticis & peripneumonicis morbis pereant, quam non exercitata.* "That strong and exercised bodies are sooner destroyed by pleuritic and peripneumonic diseases, than such as are not addicted to exercise." As now the fever varies according to the different degree of the lentor, so the same is also true with respect to the greater or less strength of the irritating stimulus. A person who has a fever from taking too

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great

* Coac. Prænot. N°. 398. Charter. Tom. VIII. pag. 875.

great a quantity of sea-salt, has a very intense thirst, but by plentiful drinking that stimulating salt is in a little time washed out from the blood. The same thing also appears by daily observation in those who labour under a crapulary fever from drinking too much wine; for these seldom lie ill above a day or two. But when a fever is kindled by the stimulating poison or contagion of the small-pox, it is very frequently fatal, and often extends itself for several weeks: For this stimulus is so far from being conquered by the fever, that by a wonderful property it converts almost all the humours of a healthy person into a like malignity with itself; for only the breath of a person sick of the small-pox will infect others that stand near, who have never yet had the disease: And inoculation of the small-pox teaches us, that only one little drop of the variolous matter is sufficient to propagate the same disease almost at pleasure. It was remarked on another occasion (see the comment to § 586. N^o. 1.) that a girl after taking arsenic survived indeed, but continued afflicted with disease for three whole years, and at length died tabid of a fever, the nature of which could not be understood by any one; for the incorrigible stimulus of the arsenical poison had so altered the whole body, that the disease which it produced could not be removed by any art.

From what has been said it is evident that the most dangerous of all fevers arise when a great force of the irritating stimulus concurs together with a great lentor. It was demonstrated in the commentary to § 97, that the strongest people have the thickest blood, and the most inclined to concretion, and on the contrary that in weak people the blood is thin. And hence appears the reason why the healthiest and strongest youths so frequently perish of the small-

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small-pox, while on the contrary the weak and languid more frequently escape. The very worst kind of the small-pox which I ever saw, and accompanied with the most malignant symptoms, was in an atrabiliary woman; but her daughter being weak and but eight years old, had a very mild kind of the pox, of which she was easily cured, even tho' she derived the infection from her mother, being under no necessity to keep her bed throughout the whole course of the disease.

S E C T. DLXXXIX.

AND therefore a fever often exerts the power of a medicine, with respect to other diseases,

In the comment to § 558, it was said, that a fever is often one of the best causes of recovery, which is confirmed by the testimony of Hippocrates and others. Many more authors of the greatest credit might be alledged to confirm the same truth; but I believe those before mentioned will suffice, and it will be hereafter made evident in the history of acute and chronical diseases, that a fever is often the best and only remedy by which the morbid matter lurking in the body can be conquered and discharged. Nor will this be surprising, if we consider what has been said before of the effects of a fever, § 587. For when, for example, a person is afflicted with a regular quartan, during the whole time of the cold fit, which often continues for several hours, all the parts of the body both internal and external are violently shook, while the extremities of the arteries being contracted, repel back their contained humours

into the larger trunks, as we are taught from the paleness of the external skin. If therefore any obstructing matter be lodged towards the extremities of the vessels, it will be thrown back into the larger, and in the mean time all the vessels and viscera are wonderfully shook and agitated by the febrile tremors. After this follows a heat gradually increasing, and at the same time there is a violent and quick motion of the humours through the vessels, which are now no longer contracted but pervious: and therefore all the fluids will act powerfully upon their containing vessels, which will again react with a proportionable force upon the fluids they contain; whence follows an intimate mixture of them altogether, and an attenuation of such as resisted the equable circulation, and at the same time there is often a happy resolution of the most obstinate obstructions, provided they have not yet acquired the irresolvable nature of a scirrhus. By all these means fevers often cure the most difficult diseases, the gout, palsy, apoplexy, &c. which are inflexible to the best artificial remedies. For the same reason perhaps it is that cold baths prudently applied are often so useful in the most stubborn diseases; for by the cold diffused thro' the body it is shook and trembles almost as in the beginning of fevers; and when the warmth of the body has overpowered the external cold, there is often a very considerable heat raised through the whole, as is experienced by those who have been rubbing their hands with snow.

But it is also a common practice for physicians to excite a fever in the cure of diseases, though they do not perhaps always think of it. How frequently and with how much success have the strongest spices been given, and in the largest doses,

doses, for the cure of dropfies, which yet are deservedly ranked among the remote causes of fevers, as was said before at § 536. N^o. 1. When paralytic patients make use of violent and long continued frictions, what do they more than hasten the return of the venal blood into the heart, and by irritating the same into more frequent contractions excite a fever (§ 573). The strongest purges and antimonial vomits excite a fever while they are in action, and are often more serviceable by that means than by the evacuation they make; and therefore they are frequently administered with this view by skilful physicians for the cure of the most difficult diseases. When a very strong decoction of the wood Guaiacum is administered in the worst diseases of the bones, it proves of little service, though drank in the largest quantities, unless an artificial Fever is also excited by the vapours of burning spirits of wine, so as to drive it with great rapidity through all the vessels, and make it penetrate to the inmost recesses of the bones (see § 529). When the pale maid, languishing with disease, does not make good blood from the ingested aliments, but has her body filled with white phlegm, which, as Galen prudently advertises us, is the half-concocted aliment (see the comment to § 75 N^o. 5.); therefore he would not have this evacuated, but retained and altered, that by the use of the most agreeable spices and steel a fever may be raised, which changes the half-concocted humours into good blood; hence in a little time the rose colour of her cheeks returns, and the weak limbs which she before could hardly draw after her, she is now able to exercise chearfully even with violent labour of body.

Even

Even in the cure of slow fevers which continually prey upon the body without any remission, and in which there is no place either for aliment or medicines, Celsus^{*} thinks that nothing remains but for the physician to change the disease. *Sæpe igitur ex aqua frigida, cui oleum sit adjectum, corpus ejus pertractandum est; quoniam interdum sic evenit, ut horror oriatur, & fiat initium novi motus, exque eo, cum magis corpus incaluit, sequatur etiam remissio.* “The body is therefore to be frequently bathed with cold water, with an addition of oil, because by that means sometimes a shivering arises, and gives birth to a new motion, from whence, when the body has gained a greater heat, there follows a remission of the disease.” It is sufficiently apparent that by this artifice he endeavoured to change a continual slow fever into an intermittent; and a little after he orders three or four draughts of mead to be given in the fever itself, or to dilute the aliments well with wine, hoping by that means to increase the fever: And in the end of the same chapter he lays down the following as a practical rule: *Sed est circumspici quoque hominis, & novare interdum, & augere morbum, & febres accendere; quia curationem, ubi id, quod est, non recipit. potest recipere id, quod futurum est.* “But it is always the part of a prudent physician, sometimes to change and increase the disease, or to kindle a fever, because as the morbid matter does not admit of a cure where it is at present, it may submit to it afterwards.”

The physician therefore well consults the interest of his patient, who considers the fever as an instrument of nature whereby she subdues changes, and expels the causes of diseases from the body,

^{*} Lib. III. cap. 9. pag. 136.

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dy, and who therefore so governs or moderates the fever, that it may neither be too sluggish, nor yet destroy the body by its furious motion.

S E C T. DXC.

HENCE the beginning, increase, height, decrease, crises, changes and cure of a fever vary both in acute diseases themselves, and in every particular kind of fever.

Since therefore the lentor and irritating stimulus (§ 588.) are observed to act in various degrees in fevers, and as there is often a different course of them both together, it is evident that the natural progress, symptoms and cure of the disease may be very different. But this is more particularly observable in acute fevers, which run through their course swiftly and with danger, (as was observed at § 564.); for in slow fevers the changes of the disease are not so sudden, nor are they often so considerable, nor so much limited to a definite time. But in epidemical fevers, as they arise from the same common cause, there is observed a greater resemblance throughout the whole course of the disease, even in different people, because the whole variation in these depends entirely upon the constitution or temperature of the sick; but in particular fevers, which arise almost from different causes in every person, a great variety is observed, since the several causes of these fevers, constitutions of the patients, and the concurrence of the different causes, with the variety of habits, may produce almost an infinite difference in the changes which happen from the beginning to the end of the disease; all which changes ought
care-

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carefully to be observed through the several stages of the disease mentioned in the present aphorism.

Beginning.] When any injury is perceived in the vital, natural, or animal functions, a disease is said to be present, § 1 ; and therefore the beginning of the disease coincides with the first appearance of injury in the functions. But it is not every disease that is accompanied with a fever, and therefore the beginning of a fever is not to be estimated from every kind of injury in the functions. But since it is evident, from what was said at § 571, that we can only know when a fever is present by the quickness of the pulse ; therefore the beginning of the fever will be when the quickness of the pulse appears increased. But since it is of the greatest moment to know the time when the fever begins, in order to make a just reckoning of the days, by which (as we observed before in treating of a crisis, § 587.) many things may be predicted in fevers, we ought therefore to use all our endeavours to avoid any mistake in this computation. If a skilful physician attended the patient at the time when the fever began, this might easily be known ; but this is very rarely the case, since the physician is hardly ever called till the disease has made some considerable progress, so that he is obliged to derive almost the whole of his knowledge concerning the beginning of the fever from the relation of the patient and his attendants. But since people usually reckon the beginning of the disease from the time they are obliged to take to their bed ; therefore this ought to be carefully enquired into to avoid fallacy. But even physicians have likewise sometimes dated the beginning of the disease from the time of the decumbiture. Thus Aëtius^r says,

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says, *Jam antea dictum est, quod principium totius morbi illud tempus dicimus, quando per morbi violentiam minuta hominis virtute, principium decubitus factum est.* “ We have already observed, “ that we call the beginning of the disease that “ time when the patient’s strength being weakened by the violence of the disease, he first takes “ to his bed. ” And in another place ² he says, *Principium totius morbi vocare oportet illud tempus, quando homo febrile inceptum ad id manifestè, ut continuitas corporis ipse solvatur, neque amplius in publicum prodire valeat, & consueta facere; atque ideo decubitu opus habeat. Non enim idem est, moleste se habere, & febricitare. Capite enim dolens, aut moleste se habens, et corpore gravatus valet ut plurimum in principii consueta peragere, donec prævalens ipsi morbus deficiat virtutem.* “ That the beginning of the whole disease ought to be called “ the time when the patient begins to be so manifestly invaded by a fever, that the body can no “ longer support itself, nor appear in publick to “ perform its accustomed business, and is therefore obliged to take to the bed. For it is not “ the same thing to find one’s self out of order “ and to have a fever. For a pain or uneasiness “ in the head, with a heaviness of the body, “ usually prevails first in the beginning, till the “ disease itself, gaining ground, over-powers the “ strength.” But to compute the beginning of the fever only from the time of the patient’s decumbiture, may cause a great error, as Galen ² well observes; because some people being stronger or more able to sustain injuries, or else being obliged to it by certain business, do not take to their bed so soon as others; while those of a tender, weak

² Lib. V. cap. 5. pag. 78. versa. ² De Diebus decretoriis Lib. I. cap. 6. Charter. Tom. VIII. pag. 459.

weak and timorous disposition, usually take to their bed immediately upon every slight occasion; and from thence he justly concludes, *Difficile esse morbi principium statuere exacte; primum enim (morbi principium) insensibile esse: ubi jam decubuerit, non morbi, sed decubitus esse principium.* “ It is “ difficult to ascertain exactly the beginning of the “ disease, because the very first invasion of the “ disease is insensible; but the time when the patient takes to his bed is not the beginning “ of the disease, but of the decumbiture.” In order therefore to avoid error as much as possible, we are to take the middle way; namely, not to date the beginning of the fever from the time of the decumbiture, or from any injured function, since some disorders may happen before the fever invades; and as Hippocrates well observes, spontaneous lassitudes presage future diseases: nor yet did he determine the beginning of the fever from the signs of this or that injured function, as is evident from the histories of his patients, given us in his books of epidemics. But yet it will not be easy for the physician to err in assigning the beginning of a fever, if he carefully attends to all that has been before said, and enquires when it was that the patient perceived those symptoms which we have pronounced to accompany every fever almost as yet known arising from an internal cause (§ 575); namely, a sense of coldness, trembling, and shaking, &c. Nor will there arise any error in reckoning up the days of the disease, although we should mistake several hours as to the time of the beginning of the fever, as Galen^b well observes, where he confutes the cavils of the sophisters; for the computation of the days

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^b Galen. de Dieb. decret. Lib. I. cap. 6. Charter. Tom. VIII. pag. 459.

is made not from the first hour, but from the first day of the fever, as we are told by Hippocrates ^c in the following words; *Observare igitur oportet primum diem, quo æger infirmari cepit, cognito unde & quando principio: id enim nosse præcipuum existimatur.* “The first day therefore of the disease upon which the patient begins to be ill, ought to be remarked, that we may know from whence, and at what time it had its beginning; for the knowledge of this is reckoned of the greatest consequence.”

But how far the beginning of the fever may extend itself, is a different question; for the times of a disease are usually distinguished into four, the beginning, increase, height, and declination. But the beginning of the disease, as Aëtius ^d well distinguishes, is variously understood. *Principium proprie dicitur impartibilis illa ac indivisibilis primi morbi impetus invasio, in qua victus homo decubuit. Principium etiam dicitur, quod per dilatationem nominant, quod usque ad tertium diem extenditur. Principium quoque dicitur proprium atque necessarium maxime contingens, quod velut partem totius morbi principium nominamus, quod non cognoscitur dierum numero, sed exacerbationum qualitate, & concomitantium symptomatum lenitate; nam in incremento & morborum & symptomatum accidentium augmentum fit.* “The beginning, says he, is properly said to be that continued and indivisible attack which the disease first makes at its invasion, and in which the patient being overcome, is obliged to take to his bed. The beginning is also said to be that which some call the dilatation or spreading of the disease, extending itself even “ to

^c De Visu acutor. Charter. Tom. XI. pag. 149. ^d Lib. V. cap. 6. pag. 78. versa. & Galen. De Crisib. Lib. I. cap. 19. Charter. Tom. VIII. pag. 404. 405.

“ to the third day. The beginning is also called
 “ that which we name the most necessary, proper;
 “ and contingent part of the whole disease, which
 “ is not known by the number of days, but from
 “ the quality of the fits, and the mildness of the
 “ concomitant symptoms; for in the increase both
 “ the disease and the symptoms are more violent.”

And when the beginning is taken for a part of the course of the disease itself, we do not understand by it the indivisible point of time, wherein health alters to disease, but a very considerable part of the whole disease itself, which Galen^e thus limits, when he says, *Nam in universum oportet cognoscere, quod, nisi manifestum appareat indicium coctionis, totum illud tempus intermedium est principium morbi.* “ For it ought especially to be
 “ known, that unless there appears a manifest sign
 “ of concoction, that whole intermediate time of
 “ the disease is to be reckoned the beginning.”

And when he illustrates this doctrine in the following chapter^f by the example of a pleurisy, he says, that if the pleuritic patient spits up nothing, but discharges urine which is clear and well coloured, and about the eleventh day begins to spit up something, but which is liquid and crude, it is manifest to every one, that this whole time of the disease ought to be called the beginning. It is therefore evident that Galen carries the beginning of the disease to a greater extent than we generally do at the present time; for according to his doctrine, the beginning comprises a considerable part of that time of the disease, which is not without reason at this day, called its increase. The beginning of the fever may be therefore said to be that time when the actions indeed appear injured, but

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^e De Crisibus Lib. I. cap. 17. Charter. Tom. VIII. pag. 401, 402. ^f Ibid. 402, 403.

as yet the number of troublesome symptoms do not suddenly increase or become more violent, as we sometimes observe in continual fevers, which for the first days keep the patient almost in the same state; but when afterwards the injuries of the actions increase, and the disease ascends with greater velocity, that time may be called the increase of the disease, and so of the rest.

But that these beginnings of fevers vary, is evident to all; for in the most acute diseases this beginning has hardly any latitude, since the violence of the disease ascends so suddenly, that the patient is immediately laid under the most extreme difficulties^s. In other fevers, which advance more slowly, the beginning of the disease is often extended to several days. But altho' there may thus seem to remain some doubt or obscurity, whereby we are not able exactly to distinguish the end of the beginning from the first appearance of the increase at all times; yet in the prognosis and cure of the fever, no damage can follow from thence, because in these such an exact distinction of the beginning and increase seems to have little use.

Increase.] All that time of the disease, which comes betwixt the beginning and greatest height or violence thereof daily advancing, is called the increase of the disease. During this period of time, the remaining health is diminished, or the functions are more and more injured; and on the contrary, the symptoms of the disease increase, and other new ones arise. In this manner Hippocrates^b seems to have understood the increase of the disease, when he says, *Sub morborum aut in principia considerandum, an statim vigorem habeant quod ex incremento manifestum est. Incrementa vero*

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^s Hippocr. Aphor. 7. Sect. I. Charter. Tom. IX. pag. 12.

^b Epidem. Lib. II. text. 6. Charter. Tom. IX. pag. 119.

ex morborum circuitibus, ex quibus etiam judicationes se manifestant; itemque ex his, quæ per circuitus fiunt, exacerbationibus, si celerius accedant, aut non: si diutius durent, aut non: si majores fiant, vel non.

“ But in the beginning of diseases we are to
 “ consider whether they immediately arrive to
 “ their height, which is manifest from their in-
 “ crease. But the increase of diseases appears
 “ manifestly from their progress; from whence
 “ also the crises shew themselves, and also from
 “ the exacerbations made in the course of the dis-
 “ ease, whether they happen swiftly or not, whe-
 “ ther they are of long or short duration, or if
 “ they are violent or not.” But, as was said be-
 fore, Galen would not have it be called the increase
 of the disease until there are manifest signs of
 concoction.

But it is to be well observed, that all those
 symptoms which shew themselves during the in-
 crease of the disease, do not proceed only from
 the cause of the disease, any further than as that
 acts together with the healthy actions that still
 remain; for life irritated by the cause of the dis-
 ease produces those disturbances (see § 573.)
 Hence Sydenham¹ prudently observes, that in
 the very worst diseases, the symptoms are some-
 times milder, than one would think agreeable to
 the nature of the disease; and this he says hap-
 pens, *Quod natura, a primo morbi impetu quasi op-
 pressa & devicta non satis valida est, ut sympto-
 mata regularia, & magnitudini morbi consona, ex-
 serat; omnia vero phænomena prorsus sunt anomala.*
*Etenim perturbata œconomia animali, & quasi dis-
 jecta, febris exinde deprimitur: quæ, obtinente ge-
 nuino naturæ ductu, vigere solet.* “ Because nature
 “ being in a manner oppressed and conquered by
 “ the

¹ In Scheda monitoria de novæ febris ingressu pag. 683.

“ the first attack of the disease, is not strong enough
 “ to produce the regular symptoms agreeable to the
 “ magnitude of the disease; but all the appearances
 “ turn out perfectly irregular. For the animal oeco-
 “ nomy being disturbed, and in a manner dejected,
 “ the fever is therefore depressed, which usually
 “ grows strong when it takes place agreeable
 “ to the regular course of nature.” All this he
 confirms by a suitable instance in a young man, who
 was almost ready to expire, though the temperate
 warmth of the external parts made it difficult to
 persuade those who attended on him that he had a
 fever: but after opening a vein, the fever, which
 had been hitherto suppressed by too great a fulness,
 raged with so much violence, that he confesses he
 never saw any fever more intense. In such a case,
 although there is really an increase of the fever present,
 yet almost all the symptoms are silent. But
 this latent force of the disease is well enough known
 to a skilful physician, when he sees the patient’s
 strength more overpowered, than is agreeable to
 the time that the disease has continued.

But it is evident enough, that the increase of the
 disease must vary in fevers, as well in the celerity
 or quickness of its advancing, as in the diversity
 and number of symptoms which accompanies the
 increase.

Height.] This is the most dangerous stage of
 the disease, because the symptoms have been all increasing
 during the progress of the disease, and are now the most
 numerous and violent; whence it is called *ἄκμῃ*, the height
 or summit: Hippocrates^{*} using the word to denote the
 highest pitch of any thing. This time of the disease is limited in the
 following manner by Aëtius¹, *Quum exacerbationes*

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statum

^{*} De prisca Medicina cap. 7. Charter. Tom. II. pag. 159.

¹ Lib. V. cap. 17. pag. 79.

statum acceperint, & similiter per omnia consequenter contigerint, concomitantibus symptomatibus neque detractis neque additis, tunc in vigore morbus esse dicatur. Vigor enim vehementissima totius morbi pars est.

“ When the fits have acquired their height, and
 “ consequently are equally diffused throughout the
 “ whole, without any decrease or diminution of the
 “ concomitant symptoms, then the disease is said
 “ to be in its height or vigour ; for the vigour or
 “ height is the most violent part of the whole disease.” Hippocrates^a also expresses this with his usual and just brevity, when he says, *Circa principia (morborum) omnia imbecilliora ; at circa vigores omnia vehementiora.* “ About the beginning of diseases every thing is weaker ; but towards the vigour or height every thing is more violent.” During this vigour of the disease the conflict betwixt the same and nature is carried on almost upon equal terms with the greatest violence, till nature either conquers the disease, or is herself thereby conquered ; and therefore at this time those great disturbances usually happen, and are followed with manifest crises, as was said before in the comment to § 587. But sometimes after this stage the force of the disease being gradually broken, health returns even without any apparent evacuation or translation of the morbid matter ; and in this case the disease is said to be resolved, as we explained by several instances under the aphorism before cited. But as this greatest violence of the disease does not consist in any single point of time, but is sometimes extended to one or two days, during which the symptoms of the disease neither increase nor diminish, therefore it is properly called the state, because the disease seems to stand in the same condition. During this time of the disease, the ancient physicians

^a Aphor. 30. Sect. II. Charter. Tom. IX. pag. 73.

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physicians never disturbed the body either by diet or medicines, but carefully attended to which way nature inclined, or at what alteration she aimed, whether to throw off the morbid matter by excretions, or to deposit the same upon some particular part, that they might be thence directed what was necessary to be done. Hence Hippocratesⁿ advises, *Incipientibus morbis, si quid movendum videatur, move. Vigentibus autem, quietem agere præstat.* "That if any thing seems necessary to be removed in the beginning of diseases, it should be done without delay. But that when diseases are in their height or vigour, it is better to do nothing." And again^o he advises: *Quum morbus in vigore fuerit, tenuissimo uti victu necesse est.* "That it is necessary to use a very thin diet, while the disease is in its vigour."

But also that the state or height of a disease varies according to the magnitude, duration and different event, is sufficiently apparent.

Decrease.] During this time of the disease, as Aëtius^p well observes, every thing runs contrary to what was observed in the increase; for the general symptoms of the disease are lessened, and the patient more easily supports the disorder, even though it has often greatly weakened his strength; and on the other hand every thing that remains of health daily increases. It is therefore evident that the greatest danger that life is in during an acute fever, is past when the disease is in its decline. Hence Galen^q will have it, that there is no danger of death after the height of a disease; and if some perished after this time of the disease, it was either through the errors of themselves, or of the

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physicians:

ⁿ Aphor. 29. Sect. II. ibid. pag. 72. ^o Aphor. 8. Sect. I. ibid. pag. 13. ^p Lib. V. cap. 18. pag. 79. ^q De Crisibus Lib. III. cap. 5. Charter. Tom. VIII. pag. 436.

physicians: for, says he, *Ubi enim natura superior evasit, & debellavit, & restitit vehementiori morbi conatui, & quæ infestabant, expugnavit, fieri non potest, ut postea succumbat.* "When nature has once become superior, has fought and reduced the more violent attempts of the disease, conquering that by which she was opposed, it is then not possible for her to be afterwards captivated." But yet, as we shall explain hereafter, the fever has sometimes introduced such an alteration in the solid and fluid parts of the body, that even after its violence is over, new diseases follow, to the force of which the patient is sometimes obliged to submit. But in that case, properly speaking, the patient is not destroyed by the fever, which long ago ceased, but by another disease.

But fevers do not always in this manner gradually decrease after their height; for sometimes in the greatest vigour of the disease there are crises, which entirely discharge all those parts, which were either the cause of the disease itself, or which have been so altered by the disease as to be repugnant to the laws of health; in which case nothing remains in the body capable of continuing the disease, so that only a weakness remains from the preceding disorder. This has been well observed by Aëtius^r, namely, that in such cases the declination of diseases does not become manifest to the senses, nor is it of any use then to enquire after it; for it is sufficient that we know the disease is faithfully, securely, and perfectly removed.

But since in fevers, which run through all these stages, the declension of them is usually proportionable to their increase, which we have proved to be various in different fevers, it is therefore evident that

^r Lib. V. cap. 19. pag. 79.

that the same will hold true with respect to their decrease.

These are the four times or stages which we meet with in all diseases, if the malignity of the disease, or the weakness of the patient do not occasion death, either in the increase or height of the disease; or if a perfect crisis happening in the height of the disease does not prevent its future declension.

Crises.] Concerning the crisis we treated before in the comment to § 587. But this is observed to vary in different fevers, both with respect to the time in which it happens, or in its being good or bad, perfect or imperfect, made at one or at several times, and by one or several emunctories at the same time, or else by translocation without any evacuation, &c.

Changes.] For a fever is very often changed into another disease either of the same nature or of a very different kind. Thus continual fevers are often converted into intermittents, and on the contrary intermittents are often changed into continual fevers. We likewise observed that the solid and fluid parts of the body often receive such an alteration by the fever, that when this is over another disease follows instead of health; concerning which we shall treat more at large in the comment to § 593. But these changes happening in fevers are very different in proportion to the cause, violence, duration, method of cure, &c. as for example very different alterations follow a fever, excited by the contagion of the small-pox, from those which are observed in the measles; and the changes in a putrid synochus are very different from those in a simple continual fever. Thus lingering fevers often terminate in abscesses,

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as Hippocrates^a has observed; and Sydenham
laments the raising of a fatal peripneumony by the
use of too hot a regimen in those afflicted with
the measles, &c.

Cure.] From what has been said it is also very
apparent that this must be very different, and we
shall still make it more evident hereafter, by what
we have to say concerning the cure of fevers.

S E C T. DXCI.

A Fever terminates either in death, ano-
ther disease, or in health.

We come now to consider the nature and num-
ber of the ways in which a fever terminates. But
it will immediately appear that it must be in one
of the three mentioned in the text. For either
the patient survives the fever or not; if he sur-
vives, either the integrity of the vital, animal, and
natural functions are restored, *i. e.* health is reco-
vered, or else there will afterwards some injury
remain in some of those functions after the fever
is ended, and this is a disease (see § 1.); and
therefore in this last case the fever may be justly
said to terminate in another disease.

But it will be of the greatest use for us to attend
carefully to all the ways of terminating a fever,
that so we may learn how far by art, as hitherto
known, assisted by proper remedies, one may
avoid or remove those things by which a fever
tends either to death or other diseases; and on the
contrary, how far we can promote those salutary
endeavours of nature and art by which the fever
may

^a Aphor. 44. Sect. IV. Charter. Tom. IX. pag. 163.

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may be governed and obliged to terminate in
health,

S E C T. DXCII.

A Fever terminates in death either from
a destruction of the solids by too great
violence, or from such a depravity of the hu-
mours that they obstruct the vital vessels, or
else hinder those actions by which new hu-
mours ought to be prepared and put in the
place of those which are consumed. Hence
inflammations, suppurations and gangrenes
following from fevers in the vital viscera, in the
heart, lungs and cerebellum, or apthous ul-
cers in the first passages, frequently prove the
cause of death from a fever.

Death is when the heart is perfectly at rest (see
the comment to § 1.); but for the heart to con-
tinue in motion requires a flux of the spirits from
the cerebellum by the cardiac nerves to the heart;
and also for the heart to receive the blood from
the veins, and the next moment to expel it into
the arteries: and therefore a sound state of the
vessels and a perviousness of the vessels are re-
quired for the continuance of life. When there-
fore the continuity of the vessels is destroyed by a
fever, and the humours so depraved as to be im-
pervious, then death follows unavoidably, as the
effect of a fever. But since life cannot be sustained
without a restitution of those humours which are
lost or consumed; therefore, if that restitution is
obstructed by a fever, death must also follow.
Let us now therefore see how each of these effects
may be produced by a fever.

From

From a destruction of the solids by too great violence.] So long as we are in health the sides of our vessels ought to be firm enough to sustain, without breaking, the impulse of the humours, by which the circulating juices are urged on through the vessels. For since the humours are moved through converging arteries, they must of necessity act with a great force upon their sides. If now the impetus of the humours through the vessels are increased, while the strength of their sides remains the same, it is very evident there will be danger of breaking their cohesion or continuity. The larger arteries indeed can bear a great force without bursting; but the final extremities of the sanguiferous arteries, which yet are the largest among the smallest vessels, are much finer than a hair, and yet through these fine and tender extremities of the arteries are the humours moved often with a force very greatly increased in fevers; whence it is apparent that these tender solids must be in great danger of breaking by the increased force of the humours in a fever. But the very fine vessels of the lungs and arteries of the encephalon, having deposited their thick callous tunics, afford very little resistance; whence the very soft pulp of the brain and cerebellum, which is intirely vascular, may be much the more easily destroyed. Practical observations frequently demonstrate that the sanguiferous arteries, which are much stronger than the serous or lymphatic, may burst by the violence of a fever. The most acute fever, which sometimes precedes or accompanies the eruption of the small-pox of the worst kind, is often attended with a violent hæmoptoe or spitting of blood from a rupture of the pulmonary vessels by the too great violence; or else bloody urine attends from the same injury

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in the kidneys; and Sydenham^{*} ingenuously confesses, that he was never able to save those patients in which these symptoms happened, and that such frequently perished in the very worst stage of the disease before the eruptions came out. Hence Hippocrates[†] ranks fevers among those causes by which the small vessels in the lungs may be stretched and broke open. If we also consider at the same time while the motion of the blood is increased, that the salts and oils of our humours are rendered more volatile and acrid, it will be very apparent that thus the tender solids will be in still greater danger of being destroyed: but this last will be from a fault in the humours, concerning which we shall speak next.

Or from such a depravity of the humours that they obstruct the vital vessels.] In treating of the effects of a fever (§ 587.) it was said, that in this disorder the most liquid parts of the humours were expressed, and the rest thickened; and thus the humours becoming impervious must occasion obstructions. But if this happens in the vital vessels (which are here understood to be those through which a free motion is absolutely necessary to continue life), namely, those of the lungs or cerebellum more especially; in that case death must follow in a short time from the fever. But since the inspissated humours are obliged to pass through the smallest vessels of the lungs and encephalon, therefore the tenacity or imperviousness of the humours in fevers usually appears most in these parts by such signs as manifestly demonstrate that the office of these viscera is disturbed. For a violent fever never continues long without being followed
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^{*} Sect. III. cap. 2. pag. 197. & in Dissertatione Epistolari, pag. 444.
[†] De internis affectionibus, cap. 1. Character. Tom. VII. pag. 638.

with a difficult respiration and delirium. Hence Hippocrates^{*} says of an ardent fever, *Plerumque velat ad pulmonis inflammationem transmutatur, & delirat.* "That generally it changes, as it were, to an inflammation of the lungs, and the patient becomes delirious." And in another place, *Quibuscumque in febre non intermittente spirandi difficultas fit, & delirium, letale*^{*}. "That a difficulty of breathing and delirium in all fevers not intermitting is a fatal sign." On the contrary he observes to us, that an easy respiration has a great influence towards health in all acute diseases accompanied by a fever, and which terminate in forty days[†]. Nor does Hippocrates condemn a delirium only, because the humours are so depraved that they cannot pass through the vessels of the encephalon; but he likewise esteemed slighter evils as mortiferous, and of the worst presage when they denoted a delirium from this cause, such as catching at imaginary flies, pulling off the bed-cloaths, lifting up the hand before the face, &c.[‡] But by what signs the violence of the fever may be known to be so great that we may reasonably fear the symptoms, will be declared hereafter in the comment to § 609.

Or hinder those actions by which new humours ought to be supplied in the place of those consumed.] As far as we know, there is not any additional or new matter mixed with the blood, but what is received by the veins which open with very numerous and minute mouths throughout the external and internal surfaces of the body, and absorb the liquors which are contiguous unto them. But since the motion of the humours through the veins

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^{*} De Morbis Lib. II. cap. 25. Charter. Tom. VII. pag. 576. & de Affectionibus cap. 3. ibid. Pag. 623. [†] Aphor. 5. Sect. IV. Charter. Tom. IX. pag. 167. [‡] Prognostic. Charter. Tom. VIII. pag. 608. [§] Ibid. pag. 606.

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is from the apex towards the basis, so that the absorbed liquors taken up by the minute venal mouths continually pass from a smaller to a larger capacity, therefore in the veins there can be no danger of an obstruction from a vice in the moving fluid; for whatever is small enough to be able to pass through the smallest extremities of the veins, may very easily pass on through the rest of the venal course (see what has been said before at § 119.) But an external compressure of the adjacent parts, and a contraction or driness of these very fine absorbing orifices, may hinder the humours from being taken into the small veins. For as we have often said before, there are innumerable arterial orifices which open throughout the whole external and internal surface of the body, through which there is a very subtle dew or vapour continually exhaled, which among other uses serves to warm and moisten the parts. If therefore the most fluid parts of the humours are exhaled by the too great violence of the fever, while the rest of them are inspissated, by that means the free course of the humours through the exhaling vessels will be impeded; and those vessels, being distended by the impervious liquid, will be swelled by the force of the humours urging behind, so as easily to compress the adjacent absorbing veins, which are always proportionably thinner than the arteries. Besides this, as the exhaling moisture is intercepted in its exhalation from the obstructed arteries, the small venal mouths must be consequently dried up, and by that means all entrance will be denied to any new humour. This is the lamentable condition of those afflicted with an ardent fever; for the tongue, the fauces, and all the internal parts of the mouth are extremely dry, when the voice becomes squeaking, and the swallowing often impracti-

practicable from the driness of the parts, while the whole skin is also rough and scaly. Hence the drinks taken in do not enter the blood, but run through the bowels, partly for the reason before mentioned, and partly because the bowels are continually stimulated with the bile corrupted in the fever; and therefore Hippocrates^a justly esteems it a fatal sign for a profuse flux of the bowels to attend in an ardent fever. These disorders will be increased when the extremities of the exhaling arteries, distended by the impervious fluid, are so urged by the force of the humours behind, as to entirely prevent the passage of the vital fluid, whence they often become gangrenous, and turn into a very dry and thick crust, with which the whole surface of the tongue, internal parts of the mouth, fauces, œsophagus, stomach, and intestines are covered; and thus all entrance is denied to liquors by these ways. This appears evidently in those who recover from these dangerous diseases; for then these crusts separate like an entire skin from the tongue and other parts; and I have frequently observed the like sloughs discharged by stool, which is an evident sign that the internal parts had been affected in the like manner. Hence appears the reason why Hippocrates says, that all those who die of an ardent fever perish with driness; (see the comment to § 100.) for the most fluid parts are exhaled by the increased motion of the humours, while the loss of them cannot be supplied, as the passage is intercepted for the entrance of new liquors.

Hence inflammations, suppurations, &c.] Since the natural humours may be thus depraved by a fever, so as to obstruct the vital vessels, it is no wonder that an inflammation should arise from a fever,

^a Coac. Prænot. N°. 130. Charter. Tom VIII. pag 858.

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fever, as the cause: but when an inflammation is raised, the several consequences of it may follow, namely a suppuration and gangrene. But that all these may take place in the viscera is evident from what was said before in the comment to § 374, and 423. But if the vital viscera are seized with these maladies from a fever, death generally follows in a little time.

Concerning the aphthæ which frequently follow continual fevers, we shall treat hereafter under a particular head. It is sufficient to remark here, that often the whole tract of the primæ viæ is spread over with very thick crusts of this kind, so as to intercept entirely all ingress of new humours to the blood, and by that means destroy the patient.

S E C T. DXCIH.

A Fever terminates in another disease when it has injured the vessels by its too great violence or motion, and dissipating the more fluid parts; or when by its too weak action its force is not sufficient to attenuate or resolve the febrile coagulum or obstructing matter; or when it deposits the critical matter upon some obstructed, dilated, or ruptured vessels: hence proceed red spots, pustules, erysipelas, measles, small-pox, phlegmons, buboes, parotids, abscesses, gangrenes, mortifications, scirrhi, &c.

We come now to consider how a fever may terminate in another disease; but this happens either
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through the injury offered by the fever to the solids or fluids, or else when that which excited the fever is thereby indeed altered, but not perfectly concocted nor expelled from the body, wherein it still continues to disturb the health: or lastly, when the humours changed by a fever are deposited upon some particular part, and there excite new diseases; but each of these deserves to be considered apart.

[By weakening or injuring the vessels with too great motion.] We have already seen under the preceding aphorism, that the vessels may be destroyed by the violent impulse of the humours increased by a fever; whence it is evident that the same cause in a less degree may over-stretch the sides of the vessels, so as to weaken them without dissolving the continuity of their parts. For, as we said before at § 26, the capacity of the vessels is measured in a ratio compounded of the force of the impelled humours directly, and of the resistance of their sides inversely. If therefore the momentum of the impelled fluid is increased while the firmness of the sides of the vessels continues the same, the capacity of the vessels must of necessity be dilated. But the humours impelled by the force of the heart into the converging arteries, not only cause their sides to recede from the access of the canal, but also elongate the same vessels. ¹⁰ This I have seen evidently, as I have observed before upon another occasion, when the great toe being cut off by one blow with the chisel, the elongated artery projected itself beyond the even surface of the wound at each systole or pulsation of the heart. The same is also confirmed by the observation that young people recovering after acute diseases, are often found to have gained considerably in their height within the space of a few

few weeks. The sides of the vessels are therefore distracted or stretched in a fever, as well longitudinally as laterally, which will lessen the cohesion of the solid parts, as we proved in the commentary to § 25, N^o. 3. from which cause alone an infinite number of disorders may follow, as we observed at § 26. For all the assimilation of the ingested aliments is, in a great measure, owing to the action of the solids upon the contained fluids, and all the secretions and excretions require a determinate amplitude of the vessels for them to be carried on agreeable to the laws of health. Hence it is that we so frequently observe dropsies, rickets, cacochymy, &c. follow after fevers of long continuance from too great a weakness of the solid parts.

And dissipating the more fluid parts inspissates the rest.] This effect of fevers was proved before in the comment to § 587, and under the preceding aphorism it was said, that death followed if the inspissated tumours obstructed the vital vessels in the lungs or cerebellum. But if the same effect, following from the same cause, happens in other viscera, whose integrity is not immediately required to continue life but only to health, then the fever terminates not in death but another disease. Hence so frequently arise the very worst obstructions in the liver, spleen, &c. after fevers have been of long continuance or ill treated, which give rise to the most obstinate chronical diseases, as will appear hereafter.

Or by its too weak action is not able to resolve the febrile coagulum.] In the comment to § 558, it was said, that a fever is that instrument of nature, by which she endeavours to conquer and change, or expel from the body whatever resists the equable circulation of the humours. But as

sometimes this febrile motion being raised with too great violence, destroys the solids, and depraves the fluids, so as to occasion death in the manner described before under the preceding aphorism; but on the contrary, this febrile motion is sometimes so languid and suffocated, either from the natural weakness of the patient, or from the perverse method of treatment, that it is not able to remove the obstacles, or resolve the coagulum making the material cause of a fever in the body: in that case the fever ceases, but health does not return, because the matter which nature endeavoured to change by the fever, or expel by some emunctory, still continues in the body unsubdued, and goes on to disturb the functions. It is therefore a general indication in every fever so to moderate the force of it, that it may not, by destroying the solids and thickening the fluids, produce inflammations, suppurations, gangrenes, &c. nor yet to let it subside so low as to be incapable of attenuating, changing, moving, and expelling the morbid matter, concerning which we shall treat more at large hereafter in the comment to § 609. Nor is it possible to inculcate sufficiently this general and practical rule, which is of the greatest moment; because many have too ill an opinion of the name of fever, and believe that it ought ever to be weakened with all their power: when at the same time it appears from the works of the anti-ents, and observations of the best physicians, that a fever often most happily cures itself, provided it be kept under a due regulation or moderate degree.

Or by depositing the critical matter, &c.] When that which by its coagulating force forms the material cause of a fever, is changed in its nature by the febrile motion, or expelled from the body

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body after a critical disturbance, health is then restored to the patient. But frequently this discharge does not happen in fevers, as was said in the comment to § 587. But the critical matter is deposited upon some part of the body, where it creates new diseases by disturbing the functions of the parts where it is lodged. But if this critical matter translated to some part is so thin as to be able to flow freely through the vessels, it is evident that then it will be neither accumulated nor stopped in the part. Hence it appears, that the particles of the critical matter ought to be large enough to obstruct the vessels, or else to enter the dilated orifices of the smaller vessels by an error of place, (see § 118.) without being able to pass thro' their extremities; or lastly, it must be extravasated by rupture of the vessels into some natural or morbid cavity. By each of these three ways the critical matter may be collected in various parts of the body, and thus a fever may terminate in another disease, as will be more evident from what follows, serving to confirm this doctrine, and prove it by example. But as those critical depositions appear most manifestly, which are observed to happen in the external parts, such are therefore chiefly reckoned up here, altho' the like in every respect also happen in the internal parts, as we are taught from the dissection of dead bodies, and as will be said hereafter in the history of acute diseases. But when the internal parts are thus affected, it is principally known from the injured functions of those parts.

Red spots.] These are said to attend when the skin appears red in several parts of the body without any manifest tumor. But these happen when the smaller vessels which naturally contain no red blood, do by an error of place admit the same, whence there is often the appearance raised of a

slight inflammation in the cutaneous vessels, when the matter, which ought to be carried off by insensible perspiration, becoming more than usually acrid, irritates the vessels through which it passes. Hence it is that these are most often observed in fevers, where the morbid matter is evacuated by insensible perspiration or sweat. They are generally of no bad consequence, and are easily cured only by diluent and cooling remedies. Thus Hippocrates observed ^b these spots, like flea-bites, about the seventh, eighth, and ninth day in fevers in the summer time, and only in women; and he adds, that none died who had these eruptions. But we shall hereafter treat of febrile eruptions under a distinct head.

Pustules.] When an obstruction and slight inflammation arises from the same causes also pustules are produced, which are distinct from red spots, inasmuch as they arise above the surface of the skin, and are elevated into small tumors.

Erysipelas.] What this disorder is, we explained before in the comment to § 380. It frequently happens that a fever arises in a healthy person, without any previously known cause, and which terminates after one, two, or more days; but at the same time, large red spots appear on the external surface of the body, and which frequently spread themselves very suddenly into a great compass. Thus I observed an erysipelas arise in the arm of a woman on the fifth day of a fever, which, in a little time, spread up to the shoulders, and by degrees extended from thence through the neck and face, till it occupied the whole head. The fever immediately ceased, while this erysipelas spread through the arm. Though there is no part of the body but what is at one time or other invaded with this disorder,

^b Epidem. 2. Charter. Tom. IX. pag. 155.

order, yet it is most frequently observed in the face. This is by Sydenham called an erysipelatous fever; and although for the most part the disorder is usually cured without danger, by a thin diet and cooling medicines, yet it sometimes becomes gangrenous^c. Hippocrates mentions a frightful erysipelas which spread among the people, and with which the patient was so sadly tortured, that the bones themselves were laid naked, and the whole arm, fore-arm, leg, &c. had their soft parts destroyed by a spreading gangrene. But that this fever critically went off, when the erysipelas appeared in the external skin, is likewise remarked by Sydenham^d in another place; and at the same time it gives us a reason why Hippocrates^e so much condemns an erysipelas striking in, and approves of its breaking out: for then a new fever is kindled when the erysipelas strikes inward, which is attended with great danger, lest the disorders should then invade the brain, lungs, &c. It is also evident, that in these erysipelatous fevers, the various event of the disease depends chiefly upon the parts which the erysipelas raised by the fever occupies; for in external parts of the body there is seldom any great damage done by it, but that it must be extremely dangerous in the internal parts no one can doubt. Nor can art do much in this case to determine the critical deposition outward; for there are no signs to distinguish this erysipelatous fever, and although any one could foresee it when epidemical, since the matter is usually deposited in various external parts of the body, yet one could have no certain sign to point out the particular part to which the attractive or derivative medicines

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^c Sect. VI. cap. 6. pag. 353.^d Idem Sect. II.

cap. 2. pag. 136.

^e Aphor. 25. Sect. VI. Charter.

Tom. XI. pag. 261.

ought to be applied (see § 134.) The only remedy, that might perhaps be used in such a case, would be to relax the whole external skin by a warm vaporous bath. From hence perhaps sometimes the most fatal events suddenly happen in fevers, which could not be reasonably expected either from their violence or malignity of the concomitant symptoms; namely, because an erysipelas seizes the membranes of the encephalon, and suddenly exciting a delirium, kills the patient. I well remember myself to have sometimes seen such cases, and have thereby learnt not rashly to accuse other physicians either of unskilfulness or negligence, who have in such cases sometimes had the patient suddenly snatched out of their hands, when it was least expected.

But that an erysipelas may invade the viscera is taught by Hippocrates^f, where he says it may be generated in the lungs, and reckons fevers among the causes of producing an erysipelas in the lungs, and at the same time gives certain signs by which an erysipelas in that part may be known. But he places all the hopes of a cure in that the erysipelas may be thrown outward in two, three or four days time at most, without which he observes such patients must perish in a little time, from the whole substance of the lungs being rendered purulent and putrid. But it must be well remarked that the signs of this disorder mentioned by Hippocrates denote indeed that an erysipelas has already invaded the lungs, but do not signify that the erysipelas is about to be formed: Whence again appears the difficulty of forming a prognosis in these erysipelalous fevers, and we shall hereafter say something in confirmation of this, when we come to treat of a quinsy.

Measles.]

^f De Morbis Lib. I. cap. 8. Charter, Tom. VII. pag. 540.

Measles.] For the eruption of these is always preceded by a fever, and more especially the regular kind of measles come out always on the fourth day; but in the anomalous small-pox the eruption is made sometimes sooner, and sometimes later^s. In these disorders it is also apparent that the morbid matter is by the fever determined towards the surface of the body; and therefore there is no great danger if the measles occupy only the exterior parts, and the patient is not treated with the hot regimen; but when a delirium or dyspnoea give reason to suspect that the like disorder invades the encephalon or lungs, the case is then often doubtful and dangerous.

Small-pox.] What has been said appears above all the most manifest in this disorder. For when the received contagion is become active in the body, it kindles a fever, in which a most skilful physician may easily be deceived, unless the small-pox are at that time epidemical, because the generality of the symptoms are like those in common to other acute continual fevers. After this fever has continued two, three or four days, there is the appearance of spots like flea-bites in different parts, whereupon all the symptoms abate, and in the distinct small-pox the fever quite ceases, so that the patient has no more suspicion of danger. The fever then ceases which arose from this wonderful and stimulating contagion; and although in the mildest kind of the small-pox the patient then seems to be recovering his health, yet in reality another disease follows when the variolous poison is not sufficiently conquered by the fever, nor expelled from the body; but here by a critical deposition it is sent towards the surface of the body,

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where

^s Sydenham Sect. V. cap. 3. pag. 292.

where it first makes small red spots, which are afterwards raised into pustules, each of which are again converted into small abscesses; and in these indeed the pus or matter is various, according to the different malignity of the disease, but always of that kind, that each drop of matter contains the same variolous poison, by which even the most healthy person may be infected with the same disease, as we are taught by inoculating the small-pox. Hence it is evident that the fever raised by variolous contagion does neither conquer nor expel the virus or miasmata, but on the contrary changes the most healthy humours of the body into a poison of the like nature, and then makes a critical deposition of them towards the surface of the body.

Phlegmons.] What a phlegmon is, and how it differs from an erysipelas, has been said before at § 370. and 380. But in the same manner as an erysipelas is thrown out of the surface of the body by the kindled fever, or else sometimes invades the internal parts with the greatest danger, so the same is also true of a phlegmon, as we are assured from daily observation in practice. In scorbutic people a fever is very often observed, which ceases after a day or two, depositing the febrile matter towards the legs, in which often arises a violent phlegmon, sometimes degenerating into malignant ulcers, or even a spreading gangrene. I have even sometimes observed a fever arise in the most healthy people without any previous observable cause, which fever has terminated after twenty-four hours, leaving a violent inflammation in some part or other of the body; but is not something of the same kind observable in acute inflammatory diseases? Certainly a pleurisy seldom happens without being preceded by a fever, which fixes the inflammation

mation among the intercostal vessels; but the same carried towards the head might have excited a fatal phrenzy, as we often observe done, when the pain vanishing from the side without good critical signs, is followed by fierce ravings or a delirium. In inflammatory quinsies I have observed that a fever arises first, and that after a day or two the tonsils become swelled or inflamed, the fever immediately going off; but when this inflammation is once fixed in the parts now mentioned, the fever returns no more afterwards, if the disease is not malignant, and the inflammation itself afterwards disperses without being followed with a suppuration; for a violent inflammation and suppuration are always attended with a fever, as we said before; but then such a fever is different from that which first deposited or fixed the inflammatory matter upon the affected parts; and this as much as the primary fever which attends in the contagious state of the small-pox, by which the morbid matter is determined towards the surface of the body, differs from the secondary fever, which accompanies and follows after the inflammatory and suppurating state of the small-pox.

It may be therefore asked whether inflammatory diseases do not more especially differ from each other in regard to the part towards which the inflammatory matter is drove by the preceding fever? This indeed seems very probable, for the general curative indications are the same in all, and the only difference arises from the parts affected. Thus when a phlegmon seizes the leg after a fever is raised, prudent physicians are careful not to disturb the deposition of the matter in this place by neglecting to use either cooling, astringent, repellent or other medicines; and then they endeavour to cure the inflammation, either by dispersing it, or promoting a mild suppuration. But when such
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a matter as this is deposited by the fever upon the brain, we study to derive the matter from thence by all the assistances of art, as soon as ever there is the least reason to suspect, either from the epidemic nature of the disease or the concomitant symptoms, that the morbid matter tends towards such a dangerous part. If this derivation of the matter cannot be obtained, we endeavour to disperse the inflammation there seated by bleeding, and other most potent and cooling remedies; because a supuration in this part is universally allowed to be either fatal, or at least always extremely dangerous. Perhaps this is what Hippocrates^a would have us understand, when he says, *Dolores & in lateribus, & in pectoribus, & in aliis (partibus) an multum differant, perdiscendum.* “ We are to learn whether pains in the side and breast differ much from those in other parts.”

Now according as the phlegmon once raised occupies different parts, or makes a different termination, the fever again ends in other diseases.

Buboes and parotides.] Namely when the inguinal or subaxillary glands are inflamed and swelled; as also those large glands seated behind the ears. But concerning these we treated before in the comment to § 416.

Abscesses, gangrenes, mortifications.] Since from what has been said before it is evident a fever sometimes terminates in a phlegmon; it is also equally evident that when once a phlegmon is produced, all its consequences or ways of terminating may follow; and therefore an abscess, gangrene, &c. may take place. But we sometimes observe in fevers that a large quantity of true matter is deposited suddenly upon some particular parts, from whence it has been discharged, although no inflammation

^a Aphor. 5. Sect. VI. Charter. Tom. IX. pag. 250.

mation preceded in those parts, nor any signs demonstrated that the matter lay before concealed in other parts, which might be taken up by the veins, and translated and deposited again upon others. This is what I have several times observed and wondered at, especially in a woman who had got over the twentieth day in a continual fever; but when she seemed to be on the recovery; and the disease was declining without any bad symptoms attending, she suddenly began to complain of an obtuse pain in each arm, when the day before there was nothing perceived amiss in those parts, which now upon a careful examination I perceived to contain a large quantity of some fluctuating humour under the integuments, which appeared not at all coloured, and being incised matter was discharged, and the abscess depurated and healed in a little time. But yet throughout the whole course of this disease I could not observe any marks of a topical inflammation or suppuration in any part of the body. I therefore believed that the material cause of the fever had been by the fever itself so changed and concocted, as to acquire a nature like that of pus or matter, though as yet it continued to flow through the vessels with the rest of the humours; and that afterwards this matter was deposited ready formed upon some part, but not generated in the parts where it found was collected. There are certainly many passages in the ancient physicians very much favouring this opinion. Hippocrates¹ tells us; *Quæcumque vero febris longior fiat, salutariter tamen decumbente homine, neque dolore detinente ob inflammationem aliquam, neque ob ullam aliam evidentem causam, huic abscessus cum tumore & dolore ad articulum aliquem, maximeque in inferioribus partibus expectandus est. Magis autem*

¹ In Prognost. Charter. Tom. VIII.. pag. 676, &c.

autem oriuntur, & breviori tempore ejusmodi abscessus, annis triginta junioribus. Suspicare autem oportet statim de abscessu in talibus, si viginti dies febris detinens superet, &c. “ That whenever a fever
 “ is long, and keeps the patient lying in a fair
 “ way, without any pain or inflammation, or
 “ without any other manifest cause, in such a
 “ patient we may expect an abscess with tumor and
 “ pain about some joint, and more especially in
 “ the lower limbs. But abscesses of this kind
 “ arise larger or more commonly, and in a shorter
 “ time in those who are under thirty years of age.
 “ But we ought always to suspect an abscess in
 “ these cases, if the patient survives after lying
 “ twenty days ill of the fever, &c.” And Galen
 * in a place which I have mentioned before upon
 another occasion (§ 387.) tells us; *Putredo autem humorum, quæ fit in vasis, similis est illi, quæ fit in inflammationibus, & abscessibus, & aliis tuberculis.*
 “ That the putrefaction of the humours made in
 “ the vessels is like that which happens in inflam-
 “ mations, abscesses and other tumors.” But he
 says there are two kinds of this putrefaction,
 and that from a mixture of these two arises a third
 kind, differing according to the mutual proportion
 of them with respect to each other. *Alterum nempe fieri, vincente natura; alterum verò devicta.*
Vincente quidem natura, uti in inflammationibus & tuberculosis omnibus tumoribus, pus fit; in humoribus autem arteriarum & venarum illud, quod subsidet in urina puri analogum. Hæc autem putredo non simpliciter putredo est, sed aliquid coctionis habet.
Manente enim concoquente facultate vasorum, putrescens tunc humor ad talem alterationem deducitur.
 “ That the one of these happens when nature
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* De Febribus Lib. I. cap. 7. Charter. Tom. VII. pag. 15.

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“overcomes the disease; and the other when the
 “disease overcomes nature: When nature over-
 “comes the disease, there is a formation of matter
 “like that which is made in inflammations, and
 “as happens in all tumors; but that which
 “subsides in the urine resembles matter, when
 “in the humours of the arteries and veins. But
 “this kind of corruption is not simply a putre-
 “faction, but a kind of concoction or digestion;
 “for while the digestive or attenuating power of
 “the vessels remains, the corrupting humour is
 “reduced to the state above-mentioned.” But
 when this is analogous to matter, flows with the
 blood, and is discharged from it by urine, in that
 case the matter of the future abscess is expelled;
 and from thence the reason is evident why Hip-
 pocrates¹ says, *Qui urinas tenues & crudas mejunt*
multo tempore, sique cætera, ut superfuturis, signa
sint, illis abscessum ad loca infra septum transversum
expectare oportet. Et contra: Quibus spes est ad
articulos abscessum fore, liberat ab abscessu urina
copiosa, & crassa, & alba reddita^m. “That in
 “those who void thin crude urine for a long
 “time together, and especially if there are other
 “signs attending, one ought to expect that an ab-
 “scess will happen to these in a part below the
 “diaphragm. But on the other hand a plentiful
 “discharge of a thick and white urine, frees those
 “from an abscess, which one might have expected
 “to happen about the joints.”

But as in this manner a laudable matter may be
 formed when nature conquers, agreeable to the
 words of Galen; so on the contrary, when nature
 is overpowered, the worst kind of corruption may
 follow;

¹ Prognost. Charter. Tom. VIII. pag. 636. ^m Aphor. 74.
 Sect. IV. Charter. Tom. IX. pag. 184.

follow ; which being deposited by the fever upon certain parts of the body, may indeed save the patient's life, and free him from the fever, but yet may occasion a sudden death of the parts where it is lodged : so that the fever then terminates in a gangrene or sphacelus, without any previous violent inflammation of the parts thus affected, and only from a bare deposition of a malignant matter thrown from the whole mass of humours upon some particular part by the fever. See what has been said concerning a gangrene and sphacelus arising from this cause, in the comment to § 423.

Scirrhi.] Although a scirrhus is generally formed by a slow collection of impervious matter about glandular parts, as we observed before in the history of it, yet in fevers there is often a sudden deposition of a like matter upon those parts, causing tumors, which, unless treated with the most emollient and discutient medicines, often degenerate into irresolvable scirrhi, as frequently happens in the buboes and parotides arising in fevers. In lying-in women a violent fever is often observed to arise suddenly, which seldom continues longer than a day or two ; and then there is a hard tumor in the breasts, which frequently turns to a scirrhus, unless skilfully treated when the fever goes off. Sydenham ^a has observed, *Quod nulla spes sit abigendi febres autumnales, quæ teneram ætatem diu cruciarint, donec abdominis regio circa lienem præcipue indurari atque tumesceri cæperit : iisdem enim gradibus, quibus hoc symptoma supervenerit, febris etiam fugam meditatur.* “ That there
 “ are no hopes of curing autumnal fevers which
 “ have a long time tortured children, until the re-
 “ gion of the abdomen begins to swell and feel
 “ hard, more especially about the spleen ; for in
 “ pro-

^a Sect. I. cap. 5. pag. 121, 122.

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“ proportion as this symptom increafes, the fever
“ goes off.” He therefore obferves, that we may
from thence make a moft certain prognoftic that
the fever is about to depart, and that thofe tumors
feem to the touch as if the vifcera contained fome
matter hardened into a fcirrhus; and this chiefly
in thofe years when autumnal intermittents were
epidemical, but that in other years thefe tumors
only appeared to the touch like a flatulent diften-
fion of the hypochondria.

S E C T. DXCIV.

A Fever terminates in health, (1.) when-
ever the material caufe is by the force
of the fever itfelf subdued, diffolved, rendered
pervious, and expelled in the form of infen-
fible perfpiration, while at the fame time the
blood recovering its equable circulation, it
allays the violence of the fever. This is the
way of terminating a fever by a refolution,
being almoft the fame in the whole body
with that part which we before defcribed in a
particular part (§ 386.). But a fever again
terminates in health likewise, (2) if the fame
matter of the difeafe is subdued, refolved, and
rendered pervious by the force of the Fever,
but yet retains fome quality repugnant to the
equable circulation, and by ftimulating the
veffels is expelled by fome fenfible evacuation
thereby excited: hence it goes off by fweat,
fputting, vomiting, a diarrhæa, or by urine,
happening after the concoction and height of
the

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the disease, usually within fourteen days, a
crisis being made.

As health is the reward promised by physic to the diseased, and the termination of a fever in health without the intervention of any other disease is always the most happy and desirable; it is therefore our interest to know and discover those efforts of nature, by which she endeavours to make a fever terminate in this manner: But a fever may end in health two ways, as when the morbid matter is so changed by the force of the fever itself, that being assimilated with the healthy humours, it may be freely moved through the vessels without any disturbance to the equable circulation, concerning which we shall treat in the next aphorism: or else the same morbid matter being subdued and rendered pervious by the force of the fever, is afterwards expelled out of the body, and this either by an insensible or a sensible evacuation, concerning which we are now to treat.

Every thing that degenerates (1.) from the laws of health either in the solid or fluid parts of the body, either preexisting before the fever was raised, and being the cause thereof, or else in effect following from and after the fever, is usually comprehended under the denomination of the material cause of the fever. For although it is repugnant for the effect to exist before the cause, and for that change which is made by the fever to be the cause of the fever itself; yet the depravity of the humours may by fever keep up the fever already excited and produced by another cause. For a fever therefore to terminate in health requires all the matter which is degenerated from its natural and healthy state to be expelled from the
body,

body, or else to receive such a change as will render it like the healthy humours.

Among the effects of a fever (§ 587.) we reckoned an attenuation of the resisting matter, a concoction of it, and a secretion thereof when concocted; and in the same place it was proved that the fever very often subdues that which resisted the equable circulation, and renders it fit to be expelled from the body by convenient outlets. When therefore a fever has subdued its material cause, and rendered it moveable, so that it may pass through the smallest exhaling vessels, it may then be expelled from the body under the form of insensible perspiration joined with those vapours which are naturally evacuated that way. But it is very apparent that when the febrile matter is reduced to such a state of tenuity as to be able to pass through the smallest extremities of the exhaling arteries, there can be no danger of its obstructing the other vessels, nor of disturbing the equable circulation. So that the humours will pass very freely from the extremities of the arteries into the veins, and the increased velocity of the circulation will soon cease, because the arterial blood, which has hitherto moved too quick, now finding a free passage into the veins, will be continually retarded in its motion through them, as it always passes from a smaller to a larger capacity. But although the obstacle which by its resistance made the fever is thus removed, yet there may still remain an irritating stimulus, from which alone also a fever might be raised in the most healthy body; as we saw before in § 586, where we enumerated the particular causes of fevers. For this reason it is added in the text, that a fever then terminates by this manner in health if at the same time it allays its violence; whether this be brought about

by an expulsion of that, which by its stimulus raised the fever, or from the same matter being rendered unactive by the fever itself, so that it is no longer able to make any irritation.

But as insensible perspiration is carried on every moment during health, without giving any uneasiness, therefore this will be the most desirable emunctory to carry off the matter of the fever. But this way of curing a fever is very much like that of removing an inflammation by dispersion or resolution, concerning which we treated before at § 386: for there also the stagnant and concreted humours, being dissolved and restored to motion, carried off the inflammation, which thing also takes place in the present disorder. But, as we there observe, it is not every inflammation that is capable of being cured by resolution, but only such as have the humours mild, their motion sedate, and the obstruction small, &c. all which is likewise true with respect to curing fevers in this manner: for if the fever has dissipated most of the thinnest humours and inspissated the rest, or has changed the healthy humours into a malignant morbid disposition, it will be in vain to expect such a mild termination of a fever in this manner into health; just as one would be deceived, if he expected to cure a violent inflammation accompanied with a great acrimony of the humours, at the same time when their most fluid and diluent parts being consumed, occasions the most obstinate obstructions. The antient physicians have therefore very prudently observed to us, (as we said in treating of the crisis, § 587.) that only slight diseases pass off by resolution, but the more violent come to a crisis; *i. e.* they are removed by sensible evacuations, which are often preceded or accompanied with great disturbances. Hence it appears with how much

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much injustice Helmont condemns the physicians, because they could not cure all fevers in this manner; and he orders the patients, who have escaped from fevers by other methods, to return God thanks for giving them strength to hold up as well under the weight of the means used by the physicians, as of the fever itself. For, says he, *Unica nimirum falce amputatur omnium febrium causa occasionalis. Id remedium est sudoriferum, quod incidit, extenuat, resolvit, liquet, abradit, & simul abstergit causam occasionalem, ubicumque locorum eadem exstiterit. Estque universalis febrium medicina, diaphoretica quidem, insensibiliter, & citra sudorem præfatos affectos patrans.* "The occasional cause of all fevers can be extirpated only by one means, which is a sudorific medicine that incides, attenuates, resolves, melts, abrades, and at the same time absterges the occasional cause, in whatever part of the body it may lodge. And, indeed, diaphoretic medicines are universally a cure for fevers, producing their forementioned effects insensibly and without sweats." This is good advice, provided it would be followed with the effects promised; but such boasters who pretend to secret medicines have always some excuse ready, when they should publish the means by which they can perform this. For, says he, *Non enim cuique Medico contingit adire Corinthum, nec licet profanare arcana Dei, qui horum dispensator manere voluit. Sat fuit Theoriam Medicam manifestasse, &c.* "It is not proper for every physician to be admitted into the designs, nor ought the secrets of God to be profaned, as he will ever remain the dispenser of them. It is sufficient that we have discovered the theory of physic, &c. ^p"

O 2

But

° Helmont. De Febribus, cap. 14. pag. 775. N°. 7.

° Ibid. pag. 776. N°. 11.

But this doctrine, if ever any thing did, has certainly introduced most fatal errors, when physicians confiding therein, have endeavoured to cure all fevers with diaphoretics only, without being solicitous whether nature inclines that way or not; whereas, if they disposed the febrile matter to be resolved by such diluents as attenuate moderately, without increasing the febrile motion, the matter might be this way commodiously evacuated, and they would do no great injury: but when they attempt to do this by hot spices, volatile salts, &c. joined with heat of the air and bed-cloaths, they add fuel to the fire, and dissipate the diluent vehicle of the blood, so as to throw the whole system into disorder. But it has been thought, that this method can be used in no case with greater reason, than in those disorders where nature usually determines the morbid matter to be thrown off by the surface of the body, as in the small-pox and measles, wherein some therefore endeavour to provoke a diaphoresis by all the assistances of art: but with what unhappy events this is followed, may be seen in Sydenham, who with a laudable courage opposed himself almost alone to the torrent of this practice, and proved, by invincible arguments as well as natural experiments, how extremely pernicious such a method of cure is; and at length towards the latter part of his life, after having been upwards of thirty years employed in the observation of diseases, he leaves posterity the following piece of good advice¹. *Quod nempe Diaphoresis, proprie loquendo, naturæ ipsius sit methodus, qua materiam febrilem foras protrudit, & præ cæteris maximè genuina sit, quoties natura, suo relicta arbitrio, dictam materiam primum digerat; dein ritè coctam per corporis*

¹ Sydenham in *Schedula Monitoria de novæ febris ingressu*, pag. 679.

poris habitum blandè expellat. Quo tamen dato & concesso, ars nihilominus, quantumcunque naturæ imitationem præ se ferat, id saltem privilegii sibi arrogare nequit, ut febribus per sudores certo exigendis par sit. Primo enim nescit ars, quo pacto materia peccans ad expulsionem subeundam ritè præparanda sit; nec si hoc sciat, certa ulla habet indicia, quibus de hujusmodi debita præparatione possit moneri. Unde etiam & tempus ciendo sudori opportunissimum ignorari necesse est, &c.

“ That indeed a diaphoresis
 “ is, properly speaking, the method of nature her-
 “ self by which she discharges the febrile matter,
 “ and is therefore beyond all others the most ge-
 “ nuine excretion, as often as nature being left to
 “ herself shall first concoct the febrile matter, and
 “ afterwards gently expel the same from the whole
 “ surface of the body. But this being supposed
 “ and allowed, art ought not therefore, under any
 “ pretence of imitating nature, to arrogate to itself
 “ the privilege of curing fevers by sweats, as the
 “ best method. For in the first place art is not
 “ acquainted with the proper means, by which the
 “ offending matter is to be prepared in order for
 “ expulsion; nor if it knew this, are there any
 “ signs whereby one may be informed that the mat-
 “ ter is thus duly prepared; and therefore the most
 “ convenient time for exciting a sweat must conse-
 “ quently be unknown likewise, &c.”

2. The other way by which a fever may termi-
 nate in health, is when the matter of the disease,
 whether pre-existing before or made by the fever,
 is by the force thereof subdued, dissolved, and
 rendered pervious so as to circulate with the rest
 of the humours through the vessels, but as yet is
 not reduced to so great a tenuity, as to be able to
 pass off by insensible perspiration, and at the same
 time is possessed of properties repugnant to an

equable circulation, being also not capable of assimilation into healthy humours; and then like a foreign stimulus it disturbs the body, and ought to be expelled by some sensible evacuation to restore health. For we find the make of the human body to be such, that it cannot bear new chyle, or too great a quantity of food of difficult digestion without uneasiness, as is evident from the shortness of breath, heaviness, oppression, thirst, increased heat, and often a slight fever, which take place after over-feeding. No wonder therefore if the matter of the disease, no longer confined to one part, but rendered moveable and wandering, should excite those new disorders and disturbances in the body, which are deservedly termed critical, because they usually precede and sometimes accompany the critical evacuations of the same matter. For this reason Hippocrates says: *Quibus crisis fit, illis nox præcedens accessionem molesta; quæ vero subsequitur, plerumque levior toleratu.* “In those who have a crisis, the night before the approach of it is troublesome or restless; but the night which follows after is generally more easy.” For the morbid matter being put in motion excites a disturbance which goes off when the matter is evacuated. Hence Galen^s well observes, that great indisposition always precedes a crisis, but that this happens the night before, if the disease is to have a crisis in the day; but if in the day-time, the disease will have its crisis in the night. For since crises happen as well in the day as in the night, therefore this observation of Galen makes a just addition to the aphorism of Hippocrates. But the matter of the disease being once rendered moveable, is expelled from the body by different outlets.

Hence

^r Aphor. 13. Sect. II. Charter. Tom. IX. pag. 51. ^s Method. Med. ad Glauc. Lib. I. cap. 16. Charter. Tom. X. pag. 365.

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Hence it goes off by sweat.] It is not every sweat that can be of service in fevers, as we observed before, and Hippocrates[†] tells us, *Sudorem multum, cum febribus acutis abortum malum*. “That a profuse sweat in the beginning of acute fevers is bad:” for in this case such a sweat is required as will evacuate from the body the matter of the disease, after being first subdued and rendered moveable by the fever itself. But the signs by which a critical sweat may be known, are carefully enumerated by Hippocrates[‡], namely, *Sudores in omnibus morbis acutis optimi sunt, quum & diebus criticis fiunt, & febrim prorsus auferunt. Boni quoque, qui toto corpore manant, & faciunt, ut homo facilius ferat morbum; qui vero nihil horum fecerint, non utiles*. “That sweats in all acute diseases are the best, “when they happen on critical days, and totally “remove the fever. Those are also good which “come from the whole body, and render the patient better able to sustain the disease; but such “as do neither of these are not useful.” But the particular days, on which those critical and salutary sweats happen in diseases, he enumerates in another place[¶], namely, *Si nempe cœperint tertio die, quinto, septimo, nono, undecimo, decimo quarto, decimo septimo, vigesimo primo, trigesimo primo, & trigesimo quarto: illi namque sudores morbos judicant. Qui vero non ita prodeunt, laborem, morbi longitudinem & reversiones significant*. “If they begin on the “third day, or the fifth, seventh, ninth, eleventh, “fourteenth, seventeenth, twenty-first, thirty-first and thirty-fourth; for such sweats terminate “the disease. But sweats which do not come “forth on these days denote difficulty, or that the

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“ disease

[†] Prorrhēt. Lib. I. N^o. 57. Charter. Tom. VIII. pag. 740.

[‡] In Prognostic. Text. 26. Charter. Tom. VIII. pag. 609.

[¶] Aphor. 36. Sect. IV, Charter. Tom. IX. pag. 158.

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“ disease will be of long continuance, or apt to
 “ return.” (See what will be said concerning this
 aphorism in the comment to § 741, treating of cri-
 tical days). But he condemns cold sweats as the
 worst of all, and also those which only arise about
 the head, face and neck; for in an acute fever
 death may be expected from such sweats, and in a
 mild fever they denote a long continuance of the dis-
 ease: on the contrary, he commends sweats which
 run down in drops, and ascend in visible vapours;
 and lastly he observes, with respect to the distinction
 of good or bad sweats, that sometimes they arise
 from a weakness of the body, like those cold and
 viscid sweats in dying people; and others again are
 expressed by the violence of inflammation^{*}, namely,
 when the most fluid parts of the blood are thus ex-
 pelled in acute inflammatory diseases, whence the
 remainder must be inspissated with the worst conse-
 quences. Whoever carefully attends to all these
 particulars, will easily be able to distinguish, whe-
 ther a sweat arising in a fever will be critical and
 salutary or not. But it would be a great happiness
 if the physician was acquainted with the signs
 whereby he might be satisfied that such a critical
 sweat is about to follow. Jacotius in his commen-
 taries to the Coan prognostics[†], will have it, *Su-
 dorem præmonstrari urinæ & alvi suppressione, cum
 absentia signorum hæmorrhagiæ & vomitus; maxime
 vero pulsu undoso & molli, delirio dum increfcit ac-
 cesso, calore ac rubore extimarum partium, ac va-
 pore quædam calido, qui ante non fuit.* “ That a
 “ suppression of the urinal and intestinal discharges,
 “ with an absence of the signs of hæmorrhage and
 “ vomiting, give previous notice that a sweat
 “ will follow; but more especially when the pulse
 “ is

^{*} In Prognost. Charter. Tom. VIII. pag. 609.
 ler. & Jacot. Comment. in Coac. pag. 219.

[†] Hol-

“ is soft and wavering, attended with a delirium
 “ when the fever increases, and a heat with red-
 “ ness in the external parts, with a hot vapour,
 “ which was not to be observed before.” But it
 is evident, that from hence the principal sign to be
 collected, is that the morbid matter is resolved
 and put into motion; nor are there any signs de-
 noting that this morbid matter will be discharged
 by other emunctories. But the soft, and knotty,
 but wave-like pulse, is observed by Galen * to be a
 sign of a future critical sweat, especially if it is also
 high and vehement: but what the nature of this knot-
 ty pulse is he determines more accurately in another
 place †, where he says, *Vermiculans, quum species
 exhibitur quasi perreptantis arteriam vermis, unda-
 rum in modum insurgentis, quumque non uno & eodem
 tempore tota distenditur arteria. Si igitur cum dia-
 stoles parvitate hoc fiat, vocatur vermiculans; sin
 autem cum magnitudine, undosus simpliciter.* “ The
 “ vermicular pulse is when the artery gives the sense,
 “ as it were of a creeping worm rising up after the
 “ manner of waves, and when the whole artery
 “ is not distended at one and the same instant. If
 “ therefore this is accompanied with a smallness of
 “ the dilatation, the pulse is called vermicular; but
 “ if accompanied with a largeness of the diastole,
 “ it is called simply (*undosus*) a knotty or wave-
 “ like pulse.” But of this nature seems to have
 been that pulse, which the Spanish physician So-
 lano (concerning whose wonderful predictions by the
 pulse only we treated in the comment to § 587) calls
inciduus or increasing, namely, when two, three,
 or four pulses successively increase one above the
 other in the same order that they follow, so that
 the

* De Præfagitione ex pulsibus Lib. II. cap. 9. Charter Tom.
 VIII. pag. 170. † De Pulsibus ad Tyrones, cap. 8. ibid.
 pag. 4.

the second is stronger than the first, the third than the second, &c. If now such a pulse is at the same time found soft, he makes it a most certain sign of a critical sweat about to happen; and says, that only once he observed a hardness in such a pulse, and then there was a critical jaundice succeeded instead of a sweat^z. But he observes that this kind of pulse is more difficult to distinguish, when this wave-like motion is perceived in a single pulsation, but not in several together successively; for then unless the artery is suddenly elevated, and strikes against the finger with a more than usual force, it can hardly be perceived so as to distinguish it and form a prognostic from thence. Certainly those pulses rising successively higher than the rest, and above each other, are not unfitly compared to the motion of waves: whence it seems very probable that the soft and wave-like pulse of Galen agrees with that which is called *inciduus* by Solano. But it is much more difficult to describe these pulses by words than to demonstrate them in the patient. This will afford a certain presage if there are critical disturbances at the same time, and if these happen on a critical day in a due time of the disease, and if at the same time no signs appear of any other critical evacuation.

But when these critical sweats are present, we must observe what Hippocrates mentions concerning all critical evacuations, namely, *Quæ judicantur, & quæ perfecte judicata sunt neque movere, neque innovare oportet, nec medicamentis neque aliis irritamentis, sed sinere.* “ That we ought to be
 “ quiet and not to alter nor to move, neither
 “ by medicines or any other irritating means,
 “ the humours in diseases which are about com-
 “ ing

^z Nihell of the Pulse, &c. pag. 8, 9.

“ing to a crisis, and which have already a “perfect crisis.” Hence therefore it is always best to promote sweats by supplying the patient with mild, diluent drinks, taking care not to let the cold air be unwarily admitted to disturb this evacuation; but to urge a sweat by heating sudorifics is always dangerous. *Ægineta* prudently advises what ought to be done in critical sweats, when he says; *Criticos sudores sinere oportet usque ad sufficientem evacuationem, & adjuvare calore mediocri & quiete; sic ut nec abstergatur sudor, alius enim alium ducit: & calido clystere & sorbitione, & somno.* “That critical sweats ought “to be encouraged till they have made a sufficient “evacuation, and promoted by rest and a moderate warmth; but yet let not the sweat be “wiped off, for the first draws more after it; and “they may be also promoted by warm clysters, “suppings, and by sleep^b.” Nor is there any great danger of these sweats becoming too profuse; for this seldom happens if the sweats are not imprudently urged beyond the natural strength by heating medicines. And if it should sometimes happen that the sweat has been discharged too copiously, so as to weaken the patient after the fever is quieted, the body may be wiped dry, and a little cooler air be gradually admitted with caution, which will easily moderate the sweats, more especially if the patient leaves his bed, and sits with an erect posture of body as long as his strength will permit.

Spitting.] In the small-pox, and more especially in the confluent kind, a profuse salivation often saves the patient from the jaws of death, as we shall observe hereafter in the history of that disease;

^a Aphor. 20. Sect. I. Charter. Tom. IX. pag. 36.

^b Lib. II. cap. 46. pag. 22. versâ.

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ease; and this spitting being suppressed by any cause, all the symptoms become greatly increased, and often sudden death follows. We likewise observe a copious discharge by spitting in those fevers which are accompanied with aphthæ, in which it frequently affords great relief; but in other diseases a critical discharge this way seldom happens.

Vomiting, diarrhæa.] These two evacuations may purge and evacuate very different humours even from the most remote viscera in the body, as will be more evident hereafter when we treat of these among the symptoms of fevers. It is no wonder therefore if the matter of the disease sometimes discharges itself by these ways; more especially since the bile corrupting is so frequently either the cause or effect of the fever, and as it may be so commodiously discharged by these ways. But as we said before of the sweats, it is not every vomiting or diarrhæa which is critical and salutary. For all these evacuations are only serviceable inasmuch as they expel the febrile matter, either wholly or in part, from the body, whereby the disease may be either entirely removed, or at least alleviated. For this reason Hippocrates^e says, *In alvi perturbationibus & vomitibus, sponte ortis, si quidem, qualia oportet purgari, purgentur; confert, & facile ferunt; sin minus, contra.* “In purgings
“and vomitings which arise spontaneously, if all
“such humours are evacuated as ought to be purged
“off that way, they are both easily tolerable and
“useful to the patient, otherwise the reverse.” Therefore the principal sign whereby the usefulness of these evacuations is known, is derived from the effects following after them. But there is great reason to hope that a vomiting or diarrhæa will be use-

^e Aphor. 2. Sect. I. Charter, Tom. IX. pag. 5.

useful if they happen after the concoction or height of the disease, when nature is prevailing over the morbid matter; for those which happen in the increase of the disease are rather symptomatical than critical evacuations, and often do more hurt than service.

But the signs which teach that nature aims at these evacuations in diseases are of the greatest use to be known by physicians. Even Hippocrates^d has made the following remarks: *Quicumque vero in febre non lethali dixerit, caput dolore, ut etiam præ oculis tenebrosos quiddam, apparere si & oris ventriculi morsus illi accesserit; biliosus vomitus aderit. Si vero & rigor accesserit, & inferiores hypochondrii partes frigidas habuerit, & adhuc citius vomitus aderit. Et si sub id tempus quid ederit aut biberit, id perquam celeriter evometur,* " That
 " whoever complains, in a fever which is not
 " fatal, of a pain in the head, or the appearance
 " of a sort of darkness before his eyes, attended
 " with a sort of heart-burn or pain in the mouth
 " of the stomach, bilious vomitings will follow.
 " But if there is also a rigor or shivering attends,
 " and a coldness is perceived in the lower parts of
 " the hypochondria, the vomiting will then hap-
 " pen sooner. And if at that time the patient
 " eats or drinks any thing, it will be vomited up
 " instantly after." But Hippocrates observes, that
 this takes place in a fever not fatal, because a pain
 of the head and dark vertigo is one of the worst
 signs in a phrenzy, nor do they then presage a
 vomiting. And in his Coan prognostics^e he says,
*Quibus febricitantibus autem anxietates sunt, &
 oris ventriculi morsus, & sputationes, vomitus fit;
 quibus vero ructus adsunt, flatus strepitus ventris,*
 &

^d In Prognostic. Charter. Tom. VIII. pag. 680. ^e N° 143. Charter. Tom. VIII. p. 859.

& *elevationes, his fit alvi exturbatio.* “ That
 “ anxieties, a pain in the mouth of the stomach,
 “ and spitting, denote a vomiting in fevers ; but
 “ when ructus’s, flatulencies, rumbling of the
 “ bowels, and a distension of the belly attend, these
 “ cause a diarrhæa.” But to these signs in another
 place ^f he adds tremblings, weariness, and pains
 in the loins, as tokens which denote a future eva-
 cuation by stool. But Galen ^g seems to have placed
 little faith in these signs of a critical diarrhæa,
 when he says that there is no manifest or proper
 sign thereof, but only that we may suspect it when
 the signs of a future crisis appear, and there is no
 reason to think that the critical evacuation will be
 made by any other way. But in the observations
 of the Spanish physician ^h lately mentioned, we
 find an intermitting pulse is reckoned a certain
 sign of a critical diarrhæa ; and that according to
 the longer or shorter duration of its intermission,
 a greater or less discharge of the matter may be
 predicted ; and the same author observes, that he
 never saw a crisis made by vomiting only, without
 a diarrhæa. But when this intermission of the
 pulse was joined with a tension or hardness, he
 observes that vomiting ought to be predicted.
 Something like this is to be found in Galen ⁱ, who
 yet seems rather to presage from thence a vomit-
 ing than a diarrhæa : For he says, *Durus autem*
pulsus, vomitus magis, quam sudores præostendere
solet ;” and a little after he adds, *Irregularis*
(ἀνώμαλος) autem pulsus fit in plurimis quidem judiciis,
& præcipue quum aliquid pugne & periculi ha-
beant ; multo verò magis, quum biliosi humores ad
ventriculum

^f No. 19. *ibid.* pag. 854. ^g Galen. de Crisibus Lib. III.
 in fine. Charter. Tom. VIII. pag. 449. ^h Nihell of the
 pulse, &c. pag. 5. ⁱ De Crisibus Lib. III. cap. ultimo.
 Charter. Tom. VIII. pag. 448.

ventriculum confluunt, perstantibus etiam aliis vomituum signis, &c. "That an irregular pulse often happens about the time of the crises, and more especially when there is some danger and struggle; but much more when the bilious humours flow to the stomach, and are attended with the other signs of vomiting, &c."

But what presage is to be formed from the colour, smell, &c. of the matter discharged by the vomiting or diarrhæa, will be declared hereafter when we come to treat of these among the symptoms of fevers.

Urine.] The urine naturally discharges all those parts of the solids and fluids as well as of the aliments which by the continual motion and heat of the healthy body incline to acrimony, and thereby to be injurious; and therefore it is no wonder if the same kind of matter is separated from the blood by the urinary passages in diseases. We have already seen (§ 593.) that the material cause of the disease being subdued and rendered pervious by nature conquering, is discharged by urine; or if that is not done, an abscess arises from the deposition of the same matter upon different parts of the body. But this, as we said before, is observed in those fevers of long duration, wherein the patient is in no danger; but whether or no the morbid matter is often discharged by the urinary passages, only after the critical disturbances, which happen in acute diseases running swiftly through their course, may still be doubted; for at least frequently we observe other evacuations at the end of the same time. When Hippocrates^k enumerates those evacuations whereby the epidemical diseases which he had described usually went off, he reckons up likewise a bleeding at the nose, a plentiful discharge

^k Epidem. Lib. I. Charter. Tom. IX. pag. 74.

discharge of urine with a large and laudable sediment, and a seasonable bilious diarrhæa or dysentery; but at the same time he observes, that many were freed from the disease not by one evacuation only, but by all of them concurring together at one time. In another place having said that a copious discharge of thick white urine frees the patient from an abscess, he adds in the same aphorism¹, *Quod si ex naribus & sanguis profluxerit, tunc brevi admodum solvitur.* “But if also a flux
“ of blood comes from the nose, then the disease
“ will terminate in a very short time.” Thus he seems to indicate that often an evacuation by urine only is not sufficient, or at least that it is often accompanied with other excretions. Solano the Spanish physician^m testifies, that he never observed a crisis by urine only, without something at least of a diarrhæa attending at the same time; and therefore he has given no particular signs whereby one may expect a crisis by the urine, but only observes, that if the intermitting pulse which denotes a critical diarrhæa be accompanied with a softness, that then we are to expect a critical evacuation by urine, together with a diarrhæa. The ancient physicians seem also to have sought more frequently for the signs of concoction and crudity in the urine, than to have expected a critical expulsion of the morbid matter therein. Thus they always condemn that thick and turbid urine which does not throw down a sediment in acute diseases, although it is highly saturated with contents; and when such a thick urine deposited a sediment, it was rather esteemed a sign of concoction than a critical evacuation. Thus Galenⁿ says, *Communis vero omnium*

¹ Aphorism. 74. Sect. IV. Charter. Tom. IX. pag. 184.

^m Nihell of the pulse, &c. pag. 7. ⁿ De Sanitate tuenda Lib. VI. cap. 4. Charter. Tom. VI. pag. 121.

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nium turbidarum urinarum nota tibi sit separatio, vel cito, vel tardè facta, vel omnino nulla. Si enim cito fiat, & subsidens sit album, & læve, & æquabile, ostendit naturam superiorem longè succis, quos concoquit. Si vero bona quidem sit subsidentia, sed longiori tempore fiat, nunciat naturam etiam longiori tempore superaturam succos. Si vero vel omnino nulla separatio fiat, vel cum malis subsidentiis, imbecillis natura est, & indiget aliquo auxilio ad succos percoquendos. “ But you may take it as a common
 “ sign in all turbid urines, whether the separation
 “ be made sooner, later, or not at all, that if the
 “ separation be made soon, depositing a white,
 “ light, and uniform sediment, it shews nature
 “ much superior to the humours which she con-
 “ cocts; but if it has a good sediment, only a
 “ long time in forming, it denotes that nature
 “ will be a longer time in conquering the hu-
 “ mours; but if there be no separation at all in
 “ the urine, or if the sediment be bad, nature is
 “ then weak, and requires some help to concoct
 “ the humours.” It is to be observed, that Ga-
 len says, nature is still occupied in the concoction,
 even though there is a light, white, and uniform
 sediment in the urine, and therefore this could not
 be taken as a critical evacuation, which supposes the
 concoction already made. Thus also Hippocrates
 says°, *Optima autem urina est, quum alba fuerit*
subsidentia, & lævis, & æquabilis per totum tempus,
donec judicetur morbus: notat enim securitatem, &
brevis temporis futurum morbum, &c. “ That the best
 “ urine is that which has a white, light and un-
 “ form sediment thro’ the whole time of the dis-
 “ ease, till it comes to a crisis; for it denotes
 “ safety, and that the disease will be of short du-
 P “ ration,

° In Prognosticis Charter. Tom. VIII. pag. 631.

“ration, &c.” From whence again it appears that from such urines they presaged the future salutary crisis of a disease, but never esteemed this sediment of the urine a critical evacuation, however well it might appear. Many more passages of authors might be alledged to confirm this opinion, but these may suffice to prove that a critical evacuation of all the morbid matter is rarely made by the urinary passages only; and many more instances of the same thing may be seen in those patients whose diseases are described by Hippocrates in his epidemics.

Happening after the concoction and height of the disease.] It was said in the comment to § 587, that what we call concoction in fevers, is such an alteration of the material cause by the fever itself, as renders it less hurtful, and disposed to be commodiously discharged; whence the reason is evident why concoction ought to precede critical and salutary evacuations. For those evacuations which are made without signs of a preceding concoction, follow from the over-powering force of the disease, and not from nature overcoming the disease; hence for example, as we said a little before, sweats are so prejudicial in the beginning of acute diseases, which yet when they follow after a concoction, happily cure the same disease. That the same is also true of other evacuations, appears evidently from what has been said before. Hence Hippocrates^p says, *Judicantia in melius non statim appareant*. “That the signs of a disease turning “for the better do not immediately appear.” But when we treated of a crisis in the place before mentioned, it was observed, that it never happens before the height of a disease, or if it does so happen, it is always imperfect and never safe, as are those concerning which we here treat.

Usually

^p De Humoribus Charter. Tom. VIII. pag. 545.

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Usually within fourteen days, a crisis being made.] For acute fevers usually terminate in this space of time, whence Hippocrates says¹, *Acuti morbi in quatuordecim diebus judicantur*. "That acute diseases terminate within fourteen days." But the term usually is deservedly added in the text, because it cannot be absolutely said that these diseases always terminate by a crisis made within that space of time, as is evident from what was said at § 564. that sometimes acute fevers run out to a much greater length, and yet are cured by critical evacuations.

S E C T. DXCV.

FINALLY, if the morbid matter, being subdued by the same force of the disease, dissolved and rendered pervious, is again assimilated with the healthy humours, it passes off without a crisis or any other disease.

That manner of terminating the fever is of all the best and most healthy, in which the material cause is so subdued and altered by the fever itself as to become perfectly like the healthy humours, and may therefore flow through the vessels with them agreeable to the laws of equable circulation, and without any injury to the functions. This might indeed be truly and properly termed a concoction or digestion, by which that which is concocted is converted into the substance of that which concocts, agreeable to the definition given of it at § 587. being very distinct from that kind of concoction which is more properly termed maturation, and whereby the matter of the

P 2

disease

¹ Aphor. 23. Sect. II. Charter. Tom. IX. pag. 65.

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disease is prepared for a discharge. Of this we have an instance in such as have a fever from too great a quantity of crude chyle mixing with the blood after eating too large a meal. For by this fever that crude chyle is subdued and assimilated into healthy humours; and when this is effected, that fever ceases without any sensible evacuation of the febrile matter.

But it is evident, that such a termination of a fever is not to be expected, unless the matter is of a nature but little differing from that of the healthy humours; and unless the force of the fever is so small, and of so short a duration as not to introduce any great alteration in the healthy humours. This can therefore take place only in the slightest fevers, and is often difficult to be distinguished from that way of terminating a fever, mentioned before in the preceding aphorism N°. 1. namely, when the febrile matter is so attenuated and subdued as to pass off by insensible perspiration. For an increase of the healthy perspiration can only be known by the use of the weighing-chair, or from a sense of lightness and activity; but the use of the weighing-chair cannot be applied to sick patients; and that lightness and activity of body, with a perfect restitution of all the functions, also happens when the febrile matter is assimilated into the healthy humours, without any evacuation. But no damage is threatened to the patient from any mistake in this matter, since by either of these ways fevers may be cured with pleasure, safety and expedition.

But when fevers are gradually carried off, tho' they have such a material cause as can neither be assimilated into healthy humours nor expelled in the form of insensible perspiration, yet the matter escapes through the other emunctories of the body,
but

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but gradually, and without those sudden disturbances which usually precede or accompany those evacuations which are properly termed critical. For it is not to be supposed that all diseases which pass off gradually, are cured without any evacuation of the morbid matter: but it is sufficient, in this case, that the matter is discharged gradually and without sudden disturbances; concerning which we treated in the comment to § 587, where we spoke more largely of crises.

When therefore the fever is more intense, or of so long a duration, that it has introduced great alterations in the solid and fluid parts of the body, one would be deceived who formed to himself an expectation that the fever would thus terminate. Hence the ancient physicians have very prudently observed, that always a return of the fever is to be expected, if it goes off very suddenly, without any sensible evacuation of the febrile matter, or without depositing the same by an abscess upon some particular part. Hippocrates^r tells us, *Quibus autem febres cessant, neque apparentibus solutionis signis, neque in diebus criticis, illis recidiva expectanda est.*

“ That a return of the fever is to be expected in
“ those who have it cease neither on the critical
“ days, nor attended with apparent signs of con-
“ coction.” And in another place^s, *Non secundum rationem levantibus non oportet fidere.* “ That
“ one ought not to trust those fevers which
“ leave the patient without a manifest reason.”

Thus Galen^t also has the following passage in the beginning of his first book concerning critical days, *Solutiones morborum, qui non paulatim immi-
nuti fuerunt, sed subito quieverunt, ut fidæ sint, re-*

P 3

quirunt

^r In Prognostic. Charter. Tom. VIII. pag. 675. ^s Aphor.
27. Sect. II. Charter. Tom. IX. pag. 69. ^t De Diebus
Criticis Lib. I. cap. 1. Charter. Tom. VIII. pag. 50.

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quirunt omnino excretionem quandam copiosam, aut abscessum insignem: nam qui sine his cessaverunt, recidivam facere amant. “The terminations of
 “diseases which do not go off gradually, but cease
 “of a sudden, should not be trusted to, with-
 “out they are attended with some copious evacu-
 “ation or considerable abscess; for the fevers
 “which go off before these love to return again.”
 Therefore in such a case he advises an exact regimen of life, that the return of the fever may be either prevented, or at least rendered less dangerous.

S E C T. DXCVI.

THE nature or genius, danger and duration of an acute fever, being observed from the beginning through its increase to the height, inform the physician in what manner it will decline, change, and terminate.

It is a matter of the greatest importance in the practice of physick for the physician to be able to fore-know the event of a fever, whether it will terminate in death, health, or other diseases, as also the different ways which the fever will take to those ends. But in order to this, a diligent observation of the disease is required from the first beginning of it through the increase to its height. But what is to be understood by the beginning, increase, and height of the disease, and how various these are in different fevers, has been said before in the comment to § 590. When a fever begins, there is always some apparent injury in the functions, and as the injury declines more from
 health

health by attacking more violently a greater number of the functions, so much worse is the disease : for, as we said from Galen in the comment to § 3 : *Cujusque morbi tanta magnitudo, quantum a naturali statu recedit.* “ The magnitude of every disease “ is to be estimated in proportion to the degree “ in which the healthy or natural state of the body declines.” If therefore the fever excited, suddenly changes all the effects of health, we may easily perceive it will be dangerous, and inclined towards death. When, for example, in the very beginning of the disease, all the strength is immediately abolished, the appetite is entirely destroyed, and the urine, intestinal fœces, &c. deviate much from their natural state, there is then just reason to fear a fatal exit. This has been well observed by Hippocrates^u, who says, *Nam & mitissimæ febres, & quæ in securissimis incedunt signis, die quarto aut ante desinunt : maxime vero malignæ, & quæ cum gravissimis sunt signis, quarto die interficiunt, vel citius.* “ That the mildest “ fevers, and which invade with the most certain signs of security, terminate on the fourth “ day, or before : but those which are most malignant, and appear with the worst signs, kill “ the patient on the fourth day, or sooner.” And afterwards he adds^v, *Quæ autem brevissimo tempore judicandæ sunt, facillimè prænoscentur, maximè namque ab initio inter se dissident. Qui enim superfuturi sunt, facile spirant, & dolore vacant, & noctu dormiunt, aliaque securissima habent signa. Qui vero pereunt, difficile spirant, delirant, vigiliant, cæteraque signa habent pessima.* “ But it may “ be easily fore-known which fevers will be determined in the shortest time ; for they are very irregular and differing among themselves

P 4

from

^u Prognostic. Charter. Tom. VIII. pag. 663.
dem, 667.

^v Ibidem.

“ from the beginning. For those patients who
 “ are to recover breathe easily, and are without
 “ pain, sleep in the night, and have others signs
 “ of the greatest security. But those who perish
 “ breathe difficultly, are delirious, watchful, and
 “ have other signs of the worst import.”

But he acknowledges greater difficulty in forming a presage of those fevers which run through their course more slowly; for in such the injuries of the functions are neither so violent, nor do they increase so suddenly; so that fevers often appear much alike in the beginning, when their events are various, and end in different spaces of time. But concerning these, Hippocrates^{*} has the following passage, *At per harum initia difficilius est præcognoscere, quæ intra longissimum tempus judicari debeant; simillima enim sunt illarum principia. Verum a primo die animadvertendum est, & ad quemque quaternarium additum considerandum, nec latebit, quo vertetur morbus.* “ But it is more difficult to know by the beginning of these, which
 “ will require the longest time to be determined
 “ in; for their beginnings are very much alike.
 “ But the disease must be watched from the first
 “ day, and all the circumstances weighed upon
 “ every fourth day added to the first, and the
 “ inclination of the disease will not then be
 “ concealed.”

It is therefore evident, that there are certain appearances which sometimes happen in the very beginning of acute fevers, which denote what the future event of the fever will be; but yet that a more sure presage may be taken from those appearances which are observable in the increase of the fever, till it arrives at its height, *Sub morborum enim principia considerandum est, an statim flo-*

^{*} In Prognostic. Charter. Tom. VIII. pag. 665.

floreant quod ex incremento manifestum est. “For in the beginning of diseases, it ought to be considered whether they flower immediately, which will be manifest from their increase.” In which passage Hippocrates^y elegantly represents the height of the disease under the metaphor of flowering, as his interpreters testify. For if the disease suddenly increases, it soon comes to its height, and the reverse. But the good or bad event of the disease is presaged from the mildness or malignity of the symptoms. From thence we also foresee whether a sudden critical change in a fever will be for the better or worse; or whether the fever will go off slowly. For, as we said before, (see § 401, 587.) violent diseases terminate critically, but slight diseases pass off insensibly. But whether the crisis will be good or bad is likewise learnt from thence. For if those sudden changes happen while nature prevails over the disease, either in or after the height of it, when the signs of concoction have preceded, we may hope for a good crisis, especially when it happens on critical days, concerning which we shall treat hereafter. But if the like disturbances happen without the signs of concoction, nor on critical days while the disease is increasing and over-powering nature, there is reason to fear a bad crisis. But what ways nature will chuse for the critical expulsion of the febrile matter, may be likewise known from a careful attention to the appearances which offer through the course of the disease, as was said more at large in the comment to § 594.

But the nature of the fever being known, will afford the greater light into all these particulars; and more especially is this knowledge of the nature

^y Hippocrat. Epid. Lib. II. textu 6. Charter. Tom. IX. pag. 119.

ture or genus of a fever necessary in such as are epidemical. Sydenham observes, that the wisest physician can neither form a sure prognosis, nor hit upon a right method of cure in such fevers, unless he has first learnt the genius of the disease by a careful observation of the circumstances of the patient, and of the ways whereby nature endeavours to cure these diseases. Thus, for example, when the small-pox are epidemic, if a physician visits a patient who never had them before, but is at present taken with a continual fever, attended with the symptoms which he has observed in other people seized with the small-pox, he will then expect that on the third or fourth day a critical deposition of the morbid matter will be made towards the surface of the body; and he will then also know that this will not be a perfect crisis, since it does not terminate the variolous fever in health, but rather in another disease: namely, when the eruptions inflame, suppurate, and sometimes turn gangrenous, &c. The same is also true in the measles, erysipelatous, and petechial fevers, &c. for in all these the happy success of the cure, as far as relates to the physician, depends on his being acquainted with the nature or genus of the disease.

But for the same reason also the different degree of danger in the disease ought to be regarded: but this is known from the greater or less velocity with which the disease increases, and from the different nature of the part affected with the fever. For in similar circumstances there is always greater danger in fevers in proportion as they come more suddenly to their height; and it is evident, that very different events may be expected, if the inflammatory or erysipelatous matter should be deposited by the fever towards the brain, or lungs,

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lungs, than if the same matter was to settle upon the arm. Therefore Galen^z says, *Distinguere autem oportet in singulo egrotante, primo quidem si sine loco affecto sit febris, ex humorum putredine, vel quia solus spiritus alteratus est. Secundo autem si membrum quoddam affectum sit causa, & quanam sit ejus conditio.* “ That one ought first to distinguish in every patient, whether the fever is without any particular part affected, whether it is from a putrefaction of the humours, or only because the breath is altered. But in the second place, if any particular part affected is the cause, enquiry must be made after the nature of the part itself.”

Duration.] The continuance of the fever is also a consideration of great moment to determine the various manner in which it may end. For if the fever has afflicted the patient a long time, it denotes that the febrile matter is very stubborn, and therefore the disorder cannot be cured by a mild resolution (§ 595); and even that it is rarely removed by critical evacuations altogether and at one time: but it may be concluded the fever will go off gradually, and take up a considerable time, or often return again at intervals, and go off with imperfect crises, or else it will terminate in some other disease. Hence Hippocrates expected an abscess in fevers of long continuance, even though the sick patient continued in a hopeful way, as was said before at § 593. On the contrary, in fevers which are mild and of short duration, a happy resolution (§ 595.) may be hoped for, or else that the febrile matter subdued and rendered pervious by the fever, will meet with an easy expulsion, under the form of in-

^z De Crisibus Lib. II. cap. 7. Charter. Tom. VIII. pag. 416.

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insensible perspiration (§ 594. N°. 1). But if such
fevers are violent, nature being over-powered by
the disease, will sink down in a little time, and
the patient will expire ; or if nature conquers the
disease, critical evacuations must be expected, (§
594. N°. 2.)

§ E C T. DXCVII.

THEREFORE from all these confide-
rations (§ 558 to 597.) the general
rules of diagnostics and prognostics in fevers
may be easily derived.

For we here treat only of the general know-
ledge of a fever of any kind ; but we shall here-
after speak of the several kinds of fevers, accord-
ing as they are properly called, either continual,
remitting, or intermitting ; and then we shall also
give the signs whereby these kinds of fevers may
be distinguished from each other.

But the diagnosis we call the evident knowledge
of the present disease, distinct from all others ; (see
the comment to § 27.) and which also denotes the
individual nature of the disease. But there are two
principles upon which the diagnoses of diseases are
founded ; the first depends on a knowledge of the
preceding causes, which are such as appear to have
produced the same disease before : and the second
is a knowledge of the disease in its own nature
and present effects. But all these may be easily
deduced from what has been said before. For we
have enumerated and reduced the several causes of
fevers into distinct classes (§ 586.) We have also
explained the individual nature and pathognomonic
signs of a fever (§ 570 to 575.) ; and the effects
of

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of a fever have been reckoned up at § 587. And therefore we have already treated of every thing from whence the diagnosis of a fever may be derived; nor can there be any room to doubt in this respect, since the quickness of the pulse, which attends the whole time in every fever, affords an infallible sign. But to the diagnosis of fevers also belongs the knowledge of their various stages or times, as distinguished into beginning, increase, height, and declension; but of all these we likewise treated before (§ 590.)

But the prognosis of a disease is that which acquaints us what the disorder will be which is about to happen, and which is not yet present, or which directs us to foresee the various effects and events of the disease already formed; but that this also may be derived from what has been said before, is sufficiently evident. For the particular causes of fevers have been enumerated, which (as was said in the comment to § 586.) do not make the disease of themselves, but only or at least most frequently in bodies predisposed. Thus for example, if I know a weak and valetudinary person is about to eat a great quantity of bacon for a breakfast, I easily foresee that in a few hours after he will have a fever. If a plethoric person drinks a great quantity of strong wine, is exposed to violent heat of the air, or exercise of body, he runs in danger of an acute fever. But from what has been said of the effects of fevers, (§ 587, 588, 589.) as also from the various events of them (§ 592, to 597.) terminating in health, death, or another disease, the rest which relates to the prognosis of fevers may be easily collected. Our next business is therefore to treat of the cure of fevers in general.

S E C T.

S E C T. DXCVIII.

THE general cure of fevers is best obtained, 1. If life and the vital powers are particularly regarded and maintained: 2. If the acrid irritating matter is corrected and expelled (§ 574.): 3. If the lentor or febrile coagulum is dissolved and discharged (§ 577.): 4. If the urgent symptoms are mitigated (§ 587).

The general cure or treatment of fevers ought to be such as will agree with all of them, tho' it may not in itself be sufficient for the cure of all. For this general treatment regards only that which is in common to every fever; namely, a quicker contraction of the heart (§ 573): but the other symptoms of fevers which accompany this general one, and which differ in various fevers, or are even sometimes contrary, require an addition to be made to this general method of treating fevers, of such things as serve to oppose these particular symptoms. After we have treated of the general cure of fevers, we shall therefore speak of those means which are adapted to the principal and most urgent symptoms of fevers; and then we shall consider under distinct heads what is further necessary to be observed besides this general treatment in the different classes of fevers. For this reason we shall be therefore obliged to treat hereafter in a particular manner of fevers which are continual, remitting, and intermitting. For to enumerate all the more trifling differences of fevers would be extremely difficult, and might occasion great confusion.

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fusion. But it will be evident that what is required in the cure of particular fevers may be easily derived from the general method of treating fevers and their principal symptoms, provided at the same time those particulars are known which ought to be chiefly regarded in the different classes of fevers.

The present aphorism therefore acquaints us with the general requisites for the cure of fevers, each of which will be afterwards considered more at large.

1. Every fever ceases by death, (§ 571) but the cure of the disease (as was said in the comment to § 4.) is such a change of a living body as removes the corporeal addition which was called the disease, and restores that whose absence made the disease. Every cure therefore supposes life remaining, and therefore this must be especially regarded or preserved. But the vital powers consist of every thing which remains of health in the patient, and on the other hand, every thing which is absent from health constitutes the disease. Hence the magnitude of the disease is measured by the greater or less recession of the powers from their natural and healthy state; (see the comment to § 3.) as on the other hand the magnitude of the vital powers is estimated from the remaining health in the patient. From these alone Hippocrates has derived his presages, which have been confirmed in prognostics by the consent of so many ages; namely, he attentively considered the patient's face, eyes, tongue, external skin, different manner of lying in bed, cheerfulness upon raising up, &c. and by that means he learnt how much was absent from health, and how much of health remained in the disease. Hence Galen^a orders all that is to be

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^a Method. Med. ad Glaucon. Lib. I. cap. 9. Charier. Tom. X. pag. 354.

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considered by the physician to be reduced under two heads, namely the disease itself, and the powers of the patient. Prosper Alpinus^b, considering these two, compares the disease to an enemy endeavouring to destroy the body ; but nature he considers as the governor of the castle besieged, endeavouring to defend the body against the hostile insults of the disease. The symptoms of the disease and the powers of the patient he considers as the soldiers of the two opposite parties acting against each other ; and as the governor of a castle sometimes makes a sudden sally and attack upon the besieging army ; so also nature, armed with the strongest faculties, and irritated by the symptoms of the disease, rises up suddenly in the crises, and either totally conquers the disease, or at least very often destroys much of the power of the disease. It is therefore evident, that nothing conduces more to a happy cure than a firmness of the strength and powers in the patient ; which are therefore by all means to be preserved. Hence the curative indication which respects life and its powers, is deservedly ranked in the first place.

2. Hitherto belongs every thing which increases the quickness of the reciprocal influx of the nervous fluid into the muscles, and of the blood into the vessels and cavities of the heart, here distinguished by the title of acrid or irritating, because we have not a better word. Certain it is, that many bodies do by their stimulus make this irritation, whose acrimony is obvious to the senses, and such as we have enumerated at § 586. and when the like irritation follows from the other stimuli, which do not fall under the senses, they are likewise usually termed acrid from their effects. Thus for example, the contagion of the small-pox, measles, plague,

^b De Præfagienda vita & morte ægrot, cap. 1. pag. 4, &c.

plague, &c. is by its irritation capable of exciting the most violent fevers; yet no one has hitherto been able to reduce these with any truth to any known species of acrimony. When therefore these irritating causes are present, the curative indication directs either to correct them so that they may be no longer offensive, or else to expel them from the body. But this correction is either made by diluting, whereby acrid substances, which of themselves stimulate, have their particles so much dispersed, that at least they become less offensive: or lastly, they are corrected by such things taken into the body as are able by an opposite force to destroy the efficacy of the first, and render the same perfectly inactive. Thus alkaline stimuli we know are corrected by acids, and acid stimuli by alkalines. But art is as yet deficient in most of these febrile stimuli, though there may perhaps be opposite antidotes unfound in the stores of nature for each poisoning stimulus. Whether or no a man who has once had the small-pox is possessed of this true antidote to the poison, though unknown to him, whereby the variolous contagion, though often received, afterwards is rendered inactive? Whether there are not causes in nature, though unknown, which make the plague cease at length, although it has been spread about very largely? But whether these antidotes correct or weaken the poisoning stimuli, or else dispose the body so as to be no longer subject to irritation from the same stimuli, whose full force it afterwards retains, the effect will either way be perfectly the same. This particular seems to have been pointed out by Helmont^c, when he says; *Morborum siquidem quorumcumque, etsi duæ sunt columnæ, quibus ædificium morbosum innititur (materia nempe occasionalis, & ma-*

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teria

^c In sine tractatus Ignotus Hydrops, pag. 417. N^o. 49, 50.

teria cum efficiente Archeali) alterutra tamen columnarum sublata, ruit totum, quod illis superstructum erat. Arcana itaque Paracelsica omnem morbum a consequenti tollunt, quatenus causam occasionalem demetunt: atque deinde occultior via est alterius arcani, per quod scilicet inducitur pax, quies, & solatium Archeo, ne scilicet indignatus morbum pariat, partumque potius deleat: imo etiam profligationem causæ occasionalis morbi ipsius meditetur. “ Al-

“ though among all sorts of diseases there are two
 “ pillars which support the whole morbid fabric,
 “ (namely the occasional matter, and the matter
 “ with the efficient archæus or spirit) yet either
 “ of these pillars being taken away, the whole superstructure which they supported falls to the
 “ ground. The secret medicines therefore of Paracelsus consequently remove every disease, in-
 “ asmuch as they destroy the occasional cause:
 “ and then there is a more secret way opened for
 “ another arcanum or medicine, by which
 “ namely a truce, peaceableness, or comfort is introduced in the archæus, that it may not be
 “ made angry to excite disease, but rather allay
 “ what disturbance is already subsisting; and even
 “ that it may contrive the destruction of the occasional cause of the disease itself.” Many such remedies have been boasted of, but as yet they have lain in obscurity, and have only been wished for to be known. Another intention still remains, namely to expel the acrid irritating stimulus from the body; and this is often performed by a salutary endeavour of nature, and sometimes it is effected by art. Thus Sydenham^d happily expelled the poisoning stimulus from the body in the plague itself, by sweats, prolonged for the space of twenty-four hours.

3. It

^d Sect. II. cap. 2. pag. 154, &c.

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3. It was said in the comment to § 588. that every obstacle impeding the free course of the blood through the extremities of the vessels was comprehended under the general denomination of a lentor, in whatever way the obstruction was formed, either from a fault of the humours, of the vessels, or of both together. For such an obstacle may be formed at the extremities of the vessels by an error of place, while the blood retains its due fluidity; only grosser parts of the humours are admitted into the dilated mouths of the smaller converging vessels, in the narrowest parts of which they stagnate without motion. But a perfect cure of a fever requires the removal of this lentor; for unless this be done, though you remove the quicker contraction of the heart, in which the individual nature of a fever consists, (§ 573.) yet all the actions will not be restored to their integrity, which supposes a perfectly free motion of the humours through all their vessels; but here the remaining lentor will injure the actions of some parts; hence frequently the worst chronical diseases remain after a fever has been removed by the use of the Peruvian bark, because the lentor was not removed together with the fever itself. For this reason also there is a common error which often prevails in the cure of inflammatory diseases, when by bleeding, clysters, &c. the force of the fever is indeed allayed, but the inflammatory viscid matter is not dissolved as it ought to be by a moderate force of the fever itself, as we shall explain hereafter in the comment to § 609.

4. The symptoms, as we said before in the comment to § 11. are all those preternatural appearances or effects which follow in the patient's body from the disease as the cause, so however as to be dis-

tinguishable from the disease itself and its proximate cause. These symptoms therefore belong to the effects of a fever enumerated before at § 587. and therefore the best method of cure for removing the effects will also remove the symptoms of the fever. But sometimes these symptoms are so troublesome to the patient that they require a separate treatment, and ought to be mitigated at least, if they cannot be entirely removed. Thus for example, in consumptive patients there is an intolerable anxiety or oppression perceived after the crude chyle of the ingested aliments hesitates in the lungs; and although this symptom often cannot be totally removed, yet it may be very much abated if the patient takes only thin aliments, in small quantities, and at repeated intervals.

It now remains for us to enquire by what means these four general intentions which make up the best method of treating fevers may be accomplished: but first, we must treat of the body. We shall therefore speak primarily of those qualities which are required in the aliments and drinks to be given to a patient ill of a fever; we shall then determine the time when they may be most commodiously given, and lastly the quantity of them to be taken.

S E C T. DXCIX.

THE life and powers of the body are best supported in fevers by fluid aliments and drinks easy of digestion, averse to putrefaction, proper to allay thirst, excite an appetite, and oppose the known cause of the disease.

There have been sometimes physicians of note who have judged that no aliment at all ought to be given in the beginning of fevers^{*}; and this we are told that they sometimes practised even to the sixth day; even Asclepiades judged, *convellendas etiam vires ægri putavit, luce, vigilia, siti ingenti, sic ut ne os quidem primis diebus elui sineret, &c. Ulterioribus enim diebus cubantis etiam luxuriæ subscripsit; primis vero tortoris vicem exhibuit.* “That the patient’s strength ought to be so far from being increased or kept up, that it should rather be weakened by admitting the light, watchings, intense thirst, &c. insomuch that he did not permit even the mouth to be washed during the first days. But in the latter days of the fever he prescribed the patient even a luxurious variety, though at first he performed the part of a torturer.” But although Celsus does not entirely approve of this method, and thinks that the patient’s strength ought not in the least to be weakened, because from weakness there is great danger; yet he recommends abstinence from food for the first days, because the concocting matter ought to be lessened, which is naturally

Q 3

digested,

^{*} Celsus Lib. III. cap. 4. pag. 118, 119.

digested, when there is no new addition made. But at present we know that even in the most healthy people great weakness will follow, and all the humours incline to putrefaction, unless we restore those which are consumed by the taking in of food and drink; much more therefore may this be feared, when the force of the circulation is increased by a fever; so that the matter overpowering the forces, is not naturally digested, as Celsus believed, but is rather corrupted by abstinence. Yet this method seems to be very antient, for Hippocrates observes; *Se novisse Medicos, his, quæ deceant, maximè contraria facientes. Volunt enim omnes, ubi sub initia morborum homines, aut duos, aut tres, aut etiam plures dies inedia præmaceraverint, ita tum sorbitiones, tum potus exhibere.* “ That
 “ he had known physicians who had acted very
 “ contrary to what they ought; for they would
 “ have all people in the beginning of diseases
 “ starve themselves by abstinence for two, three
 “ or more days, and then they administer suppers
 “ and drinks ” It is indeed a bad practice imprudently to fill the patient with aliment, but it is more highly pernicious to weaken him by too much abstinence: For as Celsus^s observes; *Medici enim officium est, ut ægrum neque supervacua materia oneret, neque imbecilliorē fame perdat.* “ It is the
 “ business of a physician neither to load the patient with needless matter, nor to destroy those
 “ who are weak by abstinence.” It is therefore evident that to support the life and powers of the body, food and drinks are to be exhibited; we come now therefore to consider and declare what qualities these ought chiefly to have.

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^f De Viſtu acutor. Charter. Tom. XI. pag. 43. ^s Cels. Lib. III. cap. 4. pag. 120.

A healthy and robust body makes good humours from almost any kind of aliment; and in such, what Helmont^b says holds true; *Nusquam qualitatem ciborum, quatenus talium, nocumentum adferre; solam vero quantitatem obesse posse.* "That the quality of the aliments never offends, as being of this or that kind; but only the quantity may be amiss." But when the body declines from health, the requisites are wanting for a due elaboration of the ingested aliments, and therefore great caution is then necessary. But Helmont believed that the very efficacious remedies, of which he boasted to have the possession, were easily able to remove the symptoms arising from the food together with the disease, and therefore he would have it; *Diætæ necessitatem a penuria aliorum medicaminum, non ciborum lenocinio, invectam fuisse.* "That the necessity of diet was introduced not from any virtue in the food, but for want of more powerful medicinesⁱ." And thus however he acknowledges that an improper diet may offend in diseases, although the ill consequences thence preceding might be removed together with the disease by the efficacy of medicines. But to pass by these let us consider what food and drink will be most convenient for those who are in a fever.

By fluid aliments and drinks.] For in order for the food to be converted into nourishment, we see it is first necessary for it to be changed into a fluid state; for the chyle is fluid before it is mixed with the blood, and besides the drink which is taken in, the food mixes with a great quantity of animal juices. For in the mouth it mixes with the saliva, in the stomach with the succus gastricus, in the intestines with the juice of the pancreas and

Q 4

both

^b Paradox. Sent. N^o. pag. 555.ⁱ Ibid. N^o. 4.

both kinds of bile; and when the chyle has arrived to the receptracle in the loins and thoracic duct, it there mixes with the lymph returning almost from every part of the body. In order therefore to give the chyle a due fluidity, there is required the integrity of so many conspiring viscera, and the mixture of so many humours. In diseases therefore wherein many of these functions are often disturbed, it will be most convenient to give fluid aliment, that it may with less difficulty be formed into good chyle. Hence Hippocrates says^k, *Potus repleri facilius est, quam cibus*. "That it is easier for one to be filled and nourished with drink than with food;" and in another place,^l *Omne victum humidum febricitantibus prodesse*. "That all moist food is serviceable for those who are ill of fevers."

[Easy of digestion.] The difficulty of digestion proceeds either from the matter itself to be digested, or else from the too great quantity of it, whereby even the most healthy body may be oppressed; or else from some property in the food which hinders it from being easily changed and assimilated into our own nature. That the food ought to be taken in small quantities will be demonstrated at § 601. But as in one ill of a fever a great many functions of the viscera are often disturbed, and as food of a difficult digestion requires a healthy state in all these; the reason is therefore evident why food and drink easy of digestion are here necessary. Every thing therefore which was recommended in the comment to § 128. N^o. 1. will be here convenient: more especially if those are chose out from that number which are known to be contrary to the cause of the disease, as we shall soon declare. What is here said is confirmed by the advice of Hippocrates;

^k Aphor. 11. Sect. II. Charter. Tom. IX. pag. 50.

^l Aphor. 16. Sect. I. ibid. pag. 32.

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crates ^m; *Quæ sanis conferunt, ægrotis eadem exhibita valentiora sunt, & oportet, vigore illorum detracto, exhibere, alioqui illa corpus non fert, sed magis nocent, quam juvant.* "That aliments which
 " are agreeable to healthy people, are too strong
 " when given to those who are sick, and therefore
 " they ought to be given after the force of them
 " is taken off, otherwise they are so far from
 " relieving the body, that they do more hurt than
 " good." Galen therefore justly condemns those physicians, as was mentioned before upon another occasion in the comment to § 25. who being methodists in name, practise without any due method, prohibiting the exhibition of aliment to the patient in the first days of the disease, while he has yet an appetite and power to take and concoct it; but afterwards they administer wine and flesh meats, and as it were pour aliment into an empty vessel, as if it was sufficient barely for the food to be taken into the body, which yet being weakened by the course of the disease, is not in the least able to digest such food.

Averse to putrefaction.] It was said in the comment to § 100. that the salts and oils of the blood become more volatile and acrid, only by an increase of its circulating motion, or which is the same, that it thus inclines to putrefaction: Since therefore the circulation is much quicker in a fever, the same consequence must be feared; and for this reason a degeneration of the humours to putrefaction is also reckoned among the effects of a fever (§ 587.) The reason is therefore evident why the diet for febrile patients ought to be chose of such a nature as is averse to putrefaction. Hippocrates used only a drink of barley, or the juice and cream of it, as is evident from the accounts which he gives us in his book concerning the diet for acute
 dis-

^m In fine Libri de Affectionibus Charter. Tom. VII. pag. 637.

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diseases: To these he added oxymel, mead and the like, all which naturally incline to a state opposite to putrefaction; for they turn sour. For the same reason also every thing which is of a fat or oily nature, and which easily acquires a rancid acrimony by a greater heat, ought cautiously to be avoided. On this account Sydenham always forbid the use of flesh meats, and even of their broths in acute diseases, and allowed only the use of panada, preparations of barley, roasted apples, and the like. Even Helmont himself, though he has almost constantly cavils against the opinions of the antient physicians, and thinks the rules of diet of but little consequence in the cure of diseases, as we observed a little before, does nevertheless condemn a diet even of flesh broths in fevers, especially such as are strong, *Lædunt namque febrientes; quia caro, ova, pisces, & juscula facile tum cadaverantur, ac minimè nutriunt.* "For persons in fevers
" are injured by these, because flesh, eggs, fish,
" and broths, easily turn to a cadaverous putrefaction, and afford little or no nourishment."

Proper to allay thirst.] As watery, subacid and obtunding medicines are the principal reckoned up against thirst, it is evident such aliments will be most convenient for this purpose. For fluid aliments and drinks have been already recommended, in which a great quantity of water abounds, and especially such as are either already acid, or which incline to be so; and therefore the same will likewise satisfy this intention.

Fit to excite an appetite.] For in fevers this is often either entirely absent or very weak; but (*cæteris paribus*) the digestion of the aliments taken in succeeds better in proportion to the appetite. But the patient is naturally inclined to desire such
aliments

* De Febribus cap. 12. N°. 4. pag. 772.

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aliments and drinks as have been before recommended. For if roasted meat be offered to a febrile patient, it will be abhorred; but if skimmed milk, a decoction of barley with citron juice, ripe garden fruits, or the like be offered, they are generally taken. Hence the appetite itself of the patient frequently informs the physician what is most convenient in this case. For this reason Hippocrates^o says, *Quoscumque cibos, aut obsonia, aut potus decumbentes expetunt, ea suppetant, si nullum corpori nocumentum sit adfuturum.* “ Whatever food, meat, or drink is desired by sick patients, should be allowed them if no damage to the body will follow from thence.” But even tho’ what the patient desires should not be convenient, yet he orders it to be allowed, unless one can certainly foresee it will be highly injurious. For thus he expresses himself in another place^p, *Paulo deterior tum potus, tum cibus, suavior tamen, melioribus quidem, sed ingratoribus, præferendus.* “ Meat and drink which is worse, if more pleasant or desirable, is to be preferred before better, which is less agreeable to the patient’s appetite.” Those physicians are therefore to be condemned in this respect, when they think it a crime of the highest nature to give way in the least to the desires of the patient, which seem to oppose the rules of art, or frequently because they do not conform to their preconceived hypothesis. There are many instances in the writers of observations, which make it evident, that when patients have taken a strong fancy to things, which every one might believe would be hurtful, yet they have found themselves extremely well after taking the same, and frequently they have the next day been so well as
to

^o De Affectionibus cap. 12. Charter. Tom. VII. pag. 633.

^p Aphor. 38. Sect. II. Charter. Tom. IX. pag. 79.

to laugh at the threatnings of the physicians, who the day before predicted death from their disobedience. A medium is therefore to be followed in these things; for it is not proper to subscribe in a servile manner to every thing which the patient desires, as is frequently done in the courts of the great; and it must be equally bad and injurious to the physician's character, always to oppose and reject with a morose severity the cravings of nature, which are sometimes salutary. When Sydenham¹ observed this in practice, he concluded, *Quod sæpius fucum facit illa, quam talem esse opinamur, ratio, quam sensus ille certissimè nobis cognitus: quodque in morborum curatione plus dandum est agrorum appetitionibus & desideriis impensioribus (modo perquam enormia non fuerint, & quæ vitam ipso facto extinguant) quam magis dubiis & fallacibus artis regulis.* "That reason, which we think to be
 " such, oftener deceives us than that which is cer-
 " tainly known to us by sense; and that more ac-
 " count is to be made of the strong desires and
 " appetites of the patient in the cure of diseases,
 " (provided they are not very enormous, and such
 " as may actually put life itself in danger) than of
 " the more doubtful and fallacious rules of art."

[Opposite to the known cause of the disease.]
 For the causes of fevers are various, and from them is derived the most certain and peculiar indication, directing the diet of febrile patients. This will appear more evidently by example: It was said at § 586, that acrid foods might be the cause of fevers; but among these, different sorts of acrimony are observed, which often require an opposite method of cure. For in young children who have a fever arising from an acid acrimony, because they live almost entirely upon acescent food, jel-
 lies

¹ Dissert. Epistol. pag. 459.

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lies of hartshorn, ivory, and the like, are convenient, as they oppose the acid partly by sheathing it, and partly by their opposite or alcalescent nature. But when a fever is kindled by food degenerating into a putrid alkaline acrimony, (see § 86.) the jellies before-mentioned would then be very pernicious, since they naturally incline to an alkaline putrefaction; and therefore in that case a diet is to be taken from barley, oats, and the like acescent food. When the impervious blood stagnates in the smallest extremities of the arteries in acute inflammatory diseases, only such aliments as are of the thinnest and most dissolving nature are convenient; but when the blood is too much dissolved by a poisonous stimulus, the diet may be prepared of aliments which incrassate and obtund.

From what has been hitherto said, one may be sufficiently able to determine the quality of the food and drink fit for febrile patients; it now remains to be enquired in what time of the fever they may be most commodiously given.

S E C T. DC.

FOOD or aliment is to be given at that time when the fever is off, or at least when its force is abated.

For the ingested aliments do not nourish, nor can they repair the strength, until they have been first changed into our own nature by the efficacy of the vessels and viscera, and by mixing with a great quantity of healthy humours. But to make this change of the ingested aliments, requires all the actions to be entire and more perfect; but if some of these actions are deficient, we may hope
for

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for a concoction of light food which is easy of digestion, which yet is always the more happily performed as the functions are more entire. It is therefore evident, that the best time of all for giving food is when the fever is off; and therefore in intermitting fevers the patient is to take his aliment in the interval of time betwixt the two fits. Concerning this, Hippocrates^r says, *In exacerbationibus autem (cibum) subducere oportet; exhibere enim, lædit. Ex quæcumque per circuitus exacerbantur, in ipsi exacerbationibus (cibum) subducere oportet*, “In the
“paroxysms or sharp fits of the disease, food must
“be prohibited, for to give it then is hurtful. And
“food is also to be prohibited in the greatest severity of those symptoms which increase and remit through the course of the disease.” But in continual fevers the difficulty is greater; for the vital indication calls for food to sustain the powers of the patient, though at the same time the fever being continually present, does not allow of a convenient time to administer it. But as we shall say hereafter at § 727, sometimes the febrile motion, when the fever is once raised, continues on in one course to the end, which properly denominates them continual: but sometimes the fever always continues upon the patient, but not uniformly, its force being sometimes remitted, and at other times increased; and such are called continual remitting fevers. In these therefore the best times of giving food will be in the remissions, because then the force of the fevers being diminished, does not so much disturb the body. Hence Hippocrates^s observes, *Diætices maximum esse, observare ac cavare, uti in acutis, sic et in longis, morbis, & febrium intensiones & remissiones, ut tempora caveantur,*

^r Aphor. 11. Sect. I. Charter. Tom. IX. pag. 15. ^s De Victu morbor. acut. Charter. Tom. XI. pag. 177.

antur, quibus non oportet cibos offerre, & cognoscantur, quando tulè offerendi sunt: uti etiam quando plurimum ab intentione abfuerint. " It is a thing
 " of the greatest consequence for the dietetic physician to observe and take care of the intensions
 " and remissions as well in lingering diseases as in
 " fevers and acute cases, that those times may be
 " avoided wherein food ought not to be given,
 " and that the times may be known which are
 " most convenient for the supplying nourishment;
 " as also the times when the violence of the disease is most abated." But the time of giving food ought to be determined as well in remitting fevers as in those which perfectly intermit, according to the different length or continuance of the intermission or remission. For although it is a general rule in practice that food is best given when the body is not at all, or least indisposed, *Minus enim corrumpitur, quod integro corpori infertur*:
 " Because the aliment is less corrupted which is
 " taken into a healthy body:" Yet if the time of the intermission or remission is so short as not to suffice for the entire digestion of the food taken, before which a return or increase of a fever takes place, then another caution becomes necessary. This has been very well remarked by Celsus^a, where he says, *Neque tamen verum est, quod Themisoni videbatur, si duabus horis integer futurus esset ager, satius esse tunc dare, ut ab integro corpore potissimum diduceretur. Sed cum hoc breve tempus non præstet, satius est, principia cibi a decedente febre, quam reliquias ab incipiente excipi. Ita, si longius tempus secuturum est, quam integerrimo dandus est: si etiam breve, antequam ex toto integer fiat. Quo loco vero integritas est, eodem est remissio,*
 quæ

^a Cels. Lib. III. cap. 4. pag. 122.
 123.

^b Ibid. pag.

quæ maxime in febre continua potest esse. “Nor
 “ yet is it true what Themison imagined, that if
 “ the patient is about to be well for two hours
 “ time, it is then best to give nourishment, that
 “ it may be thoroughly digested by the body,
 “ while it continues well. For if it could be so
 “ quickly digested, this indeed would be the best.
 “ But as this short time is not sufficient, it is there-
 “ fore better for the patient to take food when
 “ the height of the fever is declining, than to have
 “ the remains of it when the fever begins again.
 “ So that if a longer interval is about to follow,
 “ betwixt the fits, the food is to be given when
 “ the patient is the most perfectly well: but if the
 “ interval will be short, it may be given before
 “ the fit is quite off. But what is here said of a
 “ perfect intermission, is to be also understood
 “ of a remission, which may more especially take
 “ place in a continual fever.”

The greatest difficulty therefore will be in deter-
 mining the time when the food ought to be given
 in those fevers which have neither intermissions
 nor remissions. But in these fevers we observe
 three stages, the increase, height and declension;
 and the food is to be so managed in the taking, that
 the thinnest must be given in the height of the dis-
 ease, but in the increase and decline more and
 stronger aliments may be used. But Celsus* would
 be more secure in the giving food in fevers, which
 he would have done, *Antelucanis horis, quibus om-
 nes fere maxime dormiunt: deinde matutino tempore;
 quod natura sua levissimum est.* “ Before day-break,
 “ when almost all people are fast asleep, and again
 “ in the morning early the food being very light in
 “ its own nature.” But a greater or less weakness
 in the patient, and various length of the disease,
 are

* Lib. III. cap. 5. pag. 125.

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are here especially to be considered, as we shall declare hereafter. Hence Celsus * concludes those passages which have a just relation to the supplying food in diseases, as follows, *Cum eo tamen ut nullo tempore is, qui deficit, non sit sustinendus*. "That
" yet there is no time of the disease, but in which
" what is wanting ought to be supplied."

S E C T. DCI.

AND they ought to be given in a small quantity at a time, and often repeated, lest the viscera should be obliged to labour too much, or lest the aliments should be changed or corrupted.

It was said before upon another occasion from Hippocrates (see the comment to § 586. N°. 1.) that the food ought to be given in such a quantity, as that the body may be able to conquer it. But in and by a fever many of the actions necessary to the assimilation of the aliment are disturbed, and the more in proportion as the fever is more intense and of a longer duration. It is therefore required not only to give aliment which is easy of digestion, (see § 599.) but also to give it in small quantities at a time. For since the best and most wholesome aliments may be injurious by being taken in too large a quantity, even in the most healthy people, because they cannot be conquered by the digestive powers ; it will be therefore no wonder if the aliments should prove hurtful from the same cause in febrile patients, when they are taken in such a quantity as might indeed be easily tolerable to a healthy body, and yet prove too much for the weakened powers

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* Ibid. pag. 127.

of the vessels and viscera in a sick patient. Febrile patients therefore very badly consult their interest, when they take food only once or twice in a day, as when they are in health, when it ought to be taken frequently and in small quantities. Even in the most acute diseases it is best to give some liquid nourishment every hour, that so life and the powers of the body may be supported, and without giving any disturbance in the mean time from the quantity taken in.

S E C T. DCII.

THE quantity and strength of the food is determined, 1. From a fore-knowledge of the duration of the fever (§ 588, 589, 590, 596, 597.) to 1, 4, 7, 9, 11, 14, 21, 30, 40, 60 days ; for so much aliment ought to be given as will support the powers to make a concoction and crisis. The shorter the disease the less in quantity, and the weaker should be the aliment given, and the reverse. 2. From the known age of the patient, for the nearer to childhood and extreme old age, so much the more difficultly do animals support abstinence. 3. The state and violence of the disease, if known, require a variation in the quantity and qualities of the food ; in the height of the disease it ought to be extremely thin and small in quantity, but in the increase and declension food may be more copious and stronger, as the fever is more remote from the height. 4. From the place or country which the patient inhabits, for the nearer the equator,

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equator, the thinner food will be tolerable ; but nearer the poles, thin aliment cannot be so easily dispensed with. 5. From the season of the year, as the summer requires food thin and light, and the winter more strong and compact. 6. From the custom of the patient, and his natural habit or constitution ; for the higher living he was used to when in health, and the more easily it was consumed, so much more ought to be allowed in case of sickness, in proportion as the vessels and viscera have been accustomed thereto. 7. From the sense of lightness or oppression following after the aliments are taken in.

Hitherto we have treated in general of the quantity and quality of the food which may be safely administered to febrile patients. But when this comes to be determined in every particular patient, other particulars still remain to be considered, whereby we are led from these general to more special restrictions. As for example, the general indication demands liquid food, easy of digestion ; but yet the digestion depends upon what remains of health in the febrile patient ; so that hence the aliment, which was easy to digest in the beginning of the disease, may be very difficult in the height of it, not on account of the matter to be digested, but of the more weakened powers. Moreover, the different length of the disease, season of the year, custom and habit of the patient, may occasion a great deal of difference in this respect ; all which particulars we shall examine in their proper order under the present aphorism, that so we may be set

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to rights, with respect to the quantity and strength of the food to be given.

But the strength of the food is said to be that which is properly separated from it, and changed into our own nourishment by the action of the vessels and viscera. Hence Celsus^y calls that food the strongest, which contains the most nourishment. Thus there is said to be less force in a thin flesh broth than in a gravy soup. Hence Celsus^z having reckoned up various sorts of aliments, concludes the end of the chapter in the following manner.

Fere vero sequitur, ut, quo valentior quævis materia est, eo minus facile concoquatur; sed si concocta est, plus alat. Itaque utendum est materiæ genere pro viribus; modusque omnibus pro genere sumendus. Ergo imbecillis hominibus rebus infirmissimis opus est: mediocriter firmos media materia optime sustinet: Et robustis apta validissima est. Plus deinde aliquis assumere ex levioribus potest, in his magis, quæ valentissima sunt, temperare; sibi debet. “ But it follows as a natural consequence, that the stronger any matter is, the less easy is it to digest, but when once concocted it nourishes more. Therefore the kind of alimentary matter must be used and chose proportionable to the powers, and the manner of taking all aliments should be agreeable to their nature; therefore in weak people substances of the lightest texture are required; but those who are moderately strong, are best supported by food of a middling texture, while the strongest food is best adapted to nourish the robust. Moreover, a person may take more of the lighter kind of aliments, whereas they ought to be more sparing in those aliments, which are the strongest.” Since therefore the food is more difficultly assimilated by the powers of the body, when

^y Lib. II. cap. 18. pag. 96.

^z Ibid. pag. 100.

when it is filled with too great a quantity of nourishment, it is then said to have a greater force; from hence it has been customary to call such foods strong, as are more difficult to digest, though taken in a less quantity. Thus Celsus^a says, *Ovum durum valentissimæ materiæ, molle vel sordibile imbecillissimæ*; “That an egg dressed hard makes the strongest alimentary matter, but if dressed soft in the form of a supping, it is very weak or light aliment,” although a hard egg nourishes no more than a soft one. The strength of the food therefore is measured by the quantity of nourishment which it contains, and the difficulty there is in extricating the nutritious parts therefrom. In the first case a greater strength of the food gives uneasiness to weak and indisposed persons; because a greater quantity of chyle being thence made, loads the blood; and in the latter case the *primæ viæ*, or first passages of the body are most affected with uneasiness. Hence Hippocrates^b says, *Quæcumque quidem ventriculus superat, quæque corpus recipit, ea neque flatum neque tormina excitant. At si ventriculus non superet, ab his & flatus & tormina, cæteraque id genus contingunt.* “That whenever the stomach is stronger than the food, whatever be the matter taken into it, it neither occasions wind nor gripings: but if the stomach does not overcome it, then flatulencies, colics, and the like disorders proceed from thence.” But since by what has been said before in the comment to § 599, such things as create uneasiness in the *primæ viæ* are excluded from the diet of febrile patients, therefore we shall here treat only of that strength of the food, which proceeds from its containing too great a quantity of the nutritious matter.

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^a Ibid. pag. 99.
Tom. VII. pag. 633.

^b De Affectionibus cap. 13. Charter.

1. The first and principal sign whereby the quantity and strength of the food ought to be limited for febrile patients is the known length of the disease. Galen^c uses an apt simile enough in this matter, when he compares the patient's strength to one carrying a load, and the disease to the load itself; but the time which is taken up betwixt the beginning and height of the disease, he compares to the length of the way. As now one cannot foretel whether a person will be able to carry a burthen, unless his strength, the weight of the load, and the length of the way be considered, so the same holds true in diseases. But the duration of continual fevers is various, being sometimes extended to the sixtieth day, as was said before on another occasion from Hippocrates (§ 564.) and it is of those chiefly that we here treat, because food may be safely given in intermittents betwixt the fits. But although what has been said in the places cited by the numbers in the text of the present aphorism, may afford much light to determine the length of the fever, yet the difficulty will always remain in knowing at the beginning how long a time the fever will last. Hippocrates^d informs us indeed, that malignant fevers and those attended with most violent symptoms kill on the fourth day or sooner; and on the contrary that the most gentle fevers which advance with the safest signs, go off on the fourth day or sooner. But even in those fevers which are in their beginning very mild, and unaccompanied with very violent symptoms, it seems very difficult to pre-determine the time of their duration, because at first there are almost the same symptoms in such as soon admit of a cure, as in those which continue for several

^c Lib. III. de Crisibus cap. 5. Charter. Tom. VIII. pag. 457.

^d In Prognosticis Charter. Tom. VIII. pag. 663.

veral weeks. This difficulty is also acknowledged by Hippocrates * when he says, *At per horum initia difficilius est eos prænoscere, qui intra longissimum tempus judicari debeant; similia namque sunt illorum principia.* "But it is more difficult to foreknow in the beginning of those fevers which of them will be determined in the longest time, for they are alike in the beginning." Nor do I believe that any one, however well versed in practice, can be able to know that on the first day in the beginning of the fever it will terminate either in fourteen or in twenty days, unless he should know this from the genus of the disease then reigning epidemical. Therefore Hippocrates justly adds to his former sentence, *Quod a primo die animadvertendum sit, Et ad quemque quaternarium additum considerandum: neque tunc latebit, quo se versurus sit morbus.* "That attendance must be given to the disease from the first day, and the state of it considered on every fourth day added to the first; and then you will not be ignorant which way the disease inclines itself." Nor yet can any great error arise from this uncertainty, which seems to be unavoidable in prescribing the diet of febrile patients: for fevers of the worst kind, which in their own nature speedily tend to a malignant state, these we know well enough how to distinguish. But in the mild kind of fevers, as a deal of health remains, a little greater strength and quantity of the food can do no injury, though the fever should perhaps terminate sooner than expected. For although by foreknowing such a sudden exit of the fever, there would have been no absolute necessity just for that food, yet aliment endowed with those qualities, enumerated before at § 599, and given under the observance of the cau-

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tions

* In Prognosticis Charter. Tom. VIII. pag. 665.

tions (§ 601.) can hardly ever be offensive, since in these cases the digestive powers are usually as yet sufficiently strong. Add to this, that Hippocrates observes, *Majus peccatum committi in tenui, quam in paulo pleniore victu, &c. Quam ob causam victus tenuis & accuratus plerumque paulo pleniore periculosior est.* "One may offend more by a diet too thin and spare, than by one which is a little more full, &c. for which reason a very thin and exact diet is generally less safe than that which is a little fuller^r." And in the preceding aphorism he says the same, more especially with respect to acute diseases, namely, *Tenuis & exquisitus victus in morbis longis semper, tum in acutis, ubi non admittitur, periculosus.* "That a very thin and delicate diet is always dangerous in chronical diseases, as it also is in such acute diseases, where it is not convenient or allowed^s."

This being premised, it will not be very difficult to adjust the quantity and strength of the food to be given; for if, for example, I see the strength of a fever suddenly increase, and at the same time not attended with malignant symptoms, such as a difficult respiration, delirium, &c. I foresee that an ephamera or intermittent will happen, and therefore I shall be but little careful about prescribing the diet, as the fever will be off in a short time, and by that means will afford the most convenient opportunity to supply the patient with nourishment. But if a sudden increase of the fever is also attended with the worst symptoms, I foresee the disease will soon be fatal, unless relieved by all the endeavours of art; and therefore either no food at all ought to be given, or else only such as is the most dilute, and in a small quantity; as for

^r Aphor. 5. Sect. I. Charter. Tom. IX pag. 11. ^s Aphor. 4. Sect. I. ibid. pag. 9.

for example, a simple decoction of oats or barley with citron juice and the like; because there is here no danger of injuring the patient by want, since he will soon either be carried off by the violence of the disease, or else have an opportunity of supporting his strength with more and stronger food by a speedy cure, or at least a mitigation of the disease: but in those fevers which advance more slowly, the patient's diet is to be so moderated as to support the strength sufficient for the concoction and crisis, and yet in the mean time not to cause any oppression or uneasiness in the patient by an imprudent exhibition of aliments. The extremes therefore of both these are to be avoided; *Medici enim officium est ut ægrum neque supervacua materia oneret, neque imbecilliolem fame perdat.* "For it is the business of a physician neither to load the patient with superfluous matter, nor yet to destroy one who is very weak by abstinence or hunger," as Celsus observes (see the comment to § 599^h.) But we ought always to be mindful of the admonition of Hippocrates lately mentioned; namely, that a much more dangerous error may be committed in defect than in excess. For there is often some uncertainty in determining the duration of an incipient fever, as we have already observed; and therefore Hippocratesⁱ treating on this subject makes use of the word *συνεπαίρεσις*, which signifies a conjectural knowledge; for, says he, *Conjecturis autem etiam æger explorandus est, an victu ad morbi usque vigorem par sit futurus, Et utrum ille prius sit defecturus, neque tali cum victu sufficere potuerit, priusquam morbus cesserit, ac obtundatur.* "It must be enquired by reasonable conjectures in the patient,

^h Cels. Lib. III. cap. 4. pag. 120.
Charter. Tom. IX. pag. 14.

ⁱ Aphor. 9. Sect. I.

“tient, whether the diet will support him to the
 “height of the disease, or whether he will be
 “first taken off, if with such a diet he cannot
 “be supported before the disease either ceases or
 “is lessened.” But what remains to be said under
 this aphorism will suffice to prevent any error in
 this respect, and more especially that which is
 comprised in the seventh number concerning a
 sense of lightness or oppression following, for
 thence it will immediately appear whether the food
 taken is serviceable or not; and by this means the
 slightest excess may be soon discovered. If in-
 deed that could be performed which Helmont^k
 so audaciously boasts of, we should have no occasion
 for all these rules of diet: *Medici nomine indig-
 num esse voluit, qui febrientem non restituit ante
 quatrimum.* “For he would have a person to be
 “unworthy the name of a physician, if he does
 “not restore the patient from his fever within four
 “days time;” but in this, as well as in many other
 things, he seems to have been well stocked only
 with promises.

2. Hippocrates^l tells us; *Qui crescunt, calidum
 innatum habent copiosissimum, ideoque copiosissimo in-
 digent alimento, alioquin corpus absumitur.* “They
 “that are growing have more of the innate heat,
 “and therefore require the most copious diet, other-
 “wise their body is wasted away.” And in the
 preceding aphorism^m he had observed that chil-
 dren are of all the least able to bear fasting. For
 we see that animals as they are nearer their origin,
 require so much the more food in proportion.
 Nor will this seem wonderful to one who considers
 in how short a time they grow up from the least
 size

^k De Febris cap. 12: pag. 772. N^o. 7.
 Sect. I. Charter. Tom. IX. pag. 24.
 pag. 23.

^l Aphor. 14.
^m 13. Sect. I. ibid.

size to so great a bulk. The first rudiments of mankind which lay concealed almost beyond the penetration of all sense in a drop of the seminal liquor at the time of procreation, is observed to grow up to the bulk of sixteen pounds in the space of nine months, whence at that time there is required aliment not only to support present nature, but also to increase the whole, which Hippocrates has very well distinguished, when he says, *Aluntur quædam ad incrementum, & ad essentiam; quædam ad essentiam solam, ut senes: quædam etiam ad robur.* "Some bodies are nourished both for their
 " increase as well as the support of their nature or
 " essence, and some again only for the support of
 " nature, as in old people; and some likewise for
 " strength." Hence the foetus seems to continually receive nourishment prepared by the powers of the mother's body, as long as it continues in the womb. After this when it is born into the world, it most commonly sucks the breasts of its mother; and when it has acquired a greater strength of body so as to prepare nourishment for itself from the ingested food, then a healthy child usually takes more aliment in proportion to its bulk than the strongest man; and therefore likewise in diseases younger patients require more nourishment, but to be administered under the cautions before-mentioned (§ 599. to 602.) Add to this, that when young patients lie ill of a fever, who have not done growing, all the vessels are elongated by the increased force of the circulation, to which they readily yield: and from hence is observed that sudden increase in stature of body in these after recovering from diseases; and therefore here is required a proportionable increase of humours, that by filling the vessels the circulation may continue equable, and supply such elements or particles to the
 elongated

elongated solids, as may by a due cohesion, keep the parts firm, which would otherwise be greatly weakened by such an elongation of the vessels.

Hippocrates * indeed tells us, that old people bear abstinence the most easily, and this is indeed true while they are in health, and in those who flourish in an advanced age, because they are nourished neither for increase nor strength, but only to support their essence; and in these the cavities of a great number of vessels are either entirely closed up, or very much lessened, whence a less quantity is required of humours to flow thro' them: add to this, that all the vessels being now more rigid; yield less to the impelled liquids, and many of the humours, being expelled from the body in fevers (§ 587.) will occasion driness from this diminution in the quantity of liquids:

Quia naturæ progressum, qui est ad siccitatem, effugere non licet, ideo senescimus & corrumpimur.

“ But as we cannot avoid the course of nature
 “ which leads to driness, therefore we grow
 “ old, decay and die,” as was said before from Galen upon another occasion (§ 55.) and therefore the disorders following from old age will be increased by a fever, if the patient is not relieved by a soft and moistening diet. But here more especially the food must be given often, and in small quantities, because the vital strength, which is weak in old people, would be extinguished by greater quantities*; and they require but small supplies, provided they are given continually for the reasons before-mentioned. Add to this, that from abstinence or fasting in great old age, often a fatal syncope soon follows; because the quantity
 of

* Ibidem.
 Tom. IX. pag. 24.

* Hippoc. Aphor. 14. Sect. I. Charter.

of humours being lessened, the rigid vessels do not contract themselves in proportion; whence there will be no action of the vessels upon their contained fluids; and thus one of the causes of their circulation through the vessels will cease, whence a stagnation and death: for the heart by expelling the blood from its cavities dilates the arteries, but the very next moment the arteries contracting ought to promote the impulse of the blood to continue the circulation; and to do this it is necessary for the sides of the arteries to remain contiguous to their contained humours: but the vessels now rendered extremely rigid in old age, and the quantity of the humours being also dissipated by the fever, it is evident that this effect cannot easily follow. And thus the reason is evident why abstinence is so prejudicial to old people in fevers.

3. From what was said at the first number of the present aphorism, it is evident that the patient's strength ought to be sustained by suitable aliments, that it may be sufficient to make a concoction and crisis; that is, if we foresee the disease will be of so long duration, that abstinence cannot be sustained without danger. We come now to treat of regulating the quantity and strength of the food according to the different intensity of the fever itself. But it has been often said before that the ingested aliments do not nourish until they have been first subdued and assimilated by the force of the vessels and viscera, and by mixing with the healthy humours already concocted. This assimilation will be therefore better performed, as there is more of health remaining. But in the beginning of the disease the functions are less injured, and the humours degenerate less from their natural state, but the body is by degrees more and more

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more disturbed as the disease increases, 'till in the very height of it all the functions are in the greatest disorder; and from thence if the disease does not suddenly terminate by a critical evacuation or deposition of the morbid matter, it lessens again by degrees, and health increases daily. The reason is therefore evident why more and stronger food ought to be given in the increase and declension of the disease: and why on the contrary the least quantity and the thinnest food only is suitable in the greatest strength or height of the disease. But all this is perfectly agreeable to the doctrine of Hippocrates, who says, *Quum ergo morbus peracutus est, statim & extremos habet labores, & summe tenuissimo victu uti necesse est. Ubi vero non, sed pleniore victu uti conceditur, tantum (a summe tenuissimo victu) decedendum, quantum morbus ab extremis lenior recesserit.* " When therefore the " disease is extremely acute, and immediately accompanied with the worst symptoms, it will " be necessary to use the very thinnest diet possible. " But when the disease is not such, and allows " the use of a more plentiful diet, we may abate as " much of making the diet as thin as possible; " the disease being milder, is farther from being accompanied with the worst symptoms^p." But as here he says this concerning the violence and danger in several different diseases, so he likewise affirms it with respect to the several stages of the same disease in the following aphorisms^q, which run thus: *Quum morbus in vigore fuerit, tunc tenuissimo victu uti necesse est.* " When the disease " is in its height it will be necessary to use the thinnest diet." And a little after, ^r *Quibus ergo statim vigor est, his statim tenuis victus exhibendus.* Quibus

^p Aphor. 7. Sect. I. Charter. Tom. IX. pag. 12. ^q Ibid. Aphor. 8. pag. 13. ^r Ibid. Aphor. 10. pag. 15.

*Quibus vero posterius vigor futurus est, iis in ipso
 Et paulo ante ipsum cibus subtrahendus. Antea
 vero plenius alendum est, quo perstet ægrotus.* “In

“ those diseases therefore which immediately come
 “ to their height, a thin diet must be imme-
 “ diately used. But in those which come later
 “ to their height, the diet must be lessened both
 “ in the vigour itself of the disease, and a lit-
 “ tle before it; but till then the patient is
 “ to be nourished with a more full diet, that
 “ he may be able to go through the disease.”

But physicians frequently neglect this rule in the directing the diet of febrile patients: for during the first days of the disease while the patient's strength continues firm, they think he requires less aliment, and by that means neglect the most suitable time of keeping up his strength: for when the increase of the disease comes on, he is less able to bear the food which is offered, and in the very height of the disease often every kind of aliment is rejected. Hence those perform the part of a torturer, who after the manner of Asclepiades (see the comment to § 599.) allow the patient scarce any thing, even though he desires it, during the first days of the disease; but afterwards they prescribe strong and even luxuriant food against the inclination of the patient, when he is neither able to take nor to digest any thing. For the abstinence which is necessary for people who are beginning to be ill, does not consist in prohibiting them from all food, but only from such as may increase the disease, or which cannot be easily concocted and assimilated by the indisposed body. It will be therefore serviceable to give aliment in the very beginning of the disease, observing those cautions before delivered at § 599, 600, 601. that the patient's strength may be kept up, and the acrimony of the humours allayed by
 sweet

sweet chyle, which acrimony may be justly feared as a consequence of the fever; and at the same time the quantity and strength of the food should be increased or diminished in a just proportion, according as is required by the increase, height, or declension of the disease. Celsus therefore does not seem to have well expressed the sentiments of Hippocrates, when he orders the patient to abstain from food for the first days; *Quia minui tantum materiam superantem oportet, quæ naturaliter digeritur, ubi nihil novi accedit.* “Only because the
 “offending matter ought to be diminished which
 “is naturally digested, when there is no addition
 “made of new matter.” And in another place he advises, *Unum illud & semper & ubique servandum esse, ut ægri vires subinde assidens medicus inspiciat, & quandiu supererunt, abstinentia pugnet: si imbecillitatem vereri ceperit, cibo subveniat.* “Always and in every disease to observe this one
 “rule, namely, for the physician attending to examine the patient’s strength or powers at times,
 “and to oppose the disease by abstinence as long
 “as they will hold out; but if he should begin to
 “be threatened by weakness, he may have recourse to food;” the contrary of which I think has been here made evident.

4. We always observe, as we shall declare in the next paragraph, that in the greatest heats of the summer, a thin diet is most agreeable and useful; and on the contrary, that harder food may be taken in a greater quantity, and be easily digested during the winter’s cold, when the drink may be also leis, but stronger. They who live betwixt the tropics, and in countries nearest to the equator, are best pleased with a thin diet, and often live healthy and contentedly only upon grain and garden-

• Lib. III. cap. 4. pag. 118.

• Ibid. pag. 120.

garden fruits. On the contrary, they who inhabit near the poles have occasion to eat flesh and fish, which have been hardened by salting and drying in the smoke; and this more especially, when they are obliged by the severity of the winter's cold and snows to continue buried, as it were, in their houses for some months. Such a difference in the diet of healthy people, inhabiting different countries, may likewise call for a great difference in the diet of diseased patients, as will readily appear, only from considering what a power custom alone has in this respect, as will be said at N^o. 6, next following. Hence so frequently Physicians, who have undertaken a part in an embassy into foreign countries, see that another method of practice is required, and that the course which they often followed at home with success is there insufficient, or even hurtful. For in this case, the alteration of climate makes the same difference, as the change of seasons in the year to people who continue in the same country. All this has been summed up by Hippocrates with his usual brevity, when among other rules of diet he says, "*Aliquid anni tempestati, regioni, ætati & consuetudini concedendum esse*" "That some allowance must be made for the season of the year, for the country, for the age and use of custom."

5. "*Ventres enim hyeme & vere natura calidissimi sunt, ac somni longissimi. Per eas igitur anni tempestates copiosiora cibaria exhibenda, &c.*" "For the abdominal viscera are naturally warmest in the winter and spring, and the sleep is the longest. During these seasons therefore of the year, aliments are to be given more abundantly, &c." This is an observation of Hippocrates, who

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also

* Aphor. 17. Sect. I. Charter. Tom. IX. pag. 33.

* Ibid. Aphor. 15. pag. 28.

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also says, * *Æstate & autumnno cibos difficillime ferunt, hyeme facillime, vero minus.* " That in summer and autumn food is not so much desired, nor so easily digested as in winter, lessening in the spring." If to these rules we add what has been said in the comment to § 193, concerning the diet of wounded patients to be varied and governed agreeable to the different seasons of the year, the reason will be sufficient why the same circumstances ought to be observed in the diet of febrile patients. For as we said before upon another occasion from Hippocrates, (see the comment to § 196. N°. 5.) *Imbecilles diætæ frigidæ, valentes vero calidæ.* " Weak or light aliments are cooling, and strong aliments heating." Hence in the summer-heats, for the sake of a pleasing coolness, both healthy as well as indisposed people are best pleased and satisfied with the thinnest liquors and the lightest food; but in the winter's cold, stronger foods and drinks are very well digested, and better arm the body against the cold.

6. This rule is frequently neglected in the diet of febrile patients; for, it is commonly believed, that those who have in their health indulged their appetites, and been used to fill their body every day with the richest meats and drinks, may as well bear abstinence as others. But the contrary of this is fact, for such are of all people the least able to observe a lower diet: for the body having been used to such a repletion, if that is not maintained all its powers immediately sink and perish. This evidently appears in those who are used to indulge themselves every day freely in wine; for in the morning they arise dull, trembling and indisposed for every thing, 'till their strength again returns by filling themselves with meat and drink at the accustomed time:

* Hippocrat. Aphor. 18. pag. 35.

time : nor can this perverse method of life be safely changed in such, if it is not done slowly and by degrees. When therefore such patients labour under fevers, if this their custom is not a little indulged, physic will always unhappily succeed in them. For as Hippocrates observes^y, *A multo tempore enim consueta, etiamsi deteriora, insuetis minus molesta esse solent.* “ Things which we have “ been long time accustomed to, although very bad in themselves, are yet used to be less “ troublesome than those which we have not “ been accustomed to.” and therefore he advises in another place^z, *Quibus cibus aut potibus homines in victu per sanitatem utuntur, ex his presentibus ad ægrotos uti oportet.* “ That some “ of those meats and drinks ought to be allowed the patient which are commonly used in “ the diet of people in health.” And the same observation he makes in another place, with respect to the quantity of food, and the time when it ought to be given, when he says^a, *Atque bis de die cibum sumere consuetis bis (ptisana) danda est; semel vero cibum capere solitis semel danda est; prima die, &c. Verum per initia copiam dare sufficiat non multam, neque ultra modum crassam; sed quantum pro consuetudine quidquam ingerere convenit, Et ne multa vasorum inanitio oboriatur.* “ But in those who are used to take food “ twice a day (ptisan) is to be given twice; but “ it is to be given only once in the first day to “ those who have been used to take food once “ a day, &c. But in the beginning it may be “ sufficient to give not a large quantity, nor un-
S 2 “ usually

^y Hippocr. Aphor. 50. Sect. II. Charter. Tom. IX. pag. 87.

^z De Affectionibus, cap. 11. Charter. Tom. VII. pag. 631.

^a De Victu acutorum, text. 19, 20. Charter. Tom. XI. pag. 19.

“ usually strong or gross aliment, but as much as
 “ may be conveniently digested agreeable to the
 “ patient’s custom, that there may not too great
 “ emptiness arise in the vessels.

But it is to be observed, that Hippocrates here speaks of the beginning of diseases; for as the disease advances, both the quantity and strength of the food ought to be lessened, as we have seen at N^o. 3, under the present aphorism. Many more instructions of the like kind are given by Hippocrates, which prove how great an allowance ought to be made for the custom in the diet of sick people; but, I believe, these may suffice.

Boërhaave was used upon this occasion to entertain his audience with the following history; A man bearing the greatest rule in a neighbouring village, being a hard drinker, lay ill of an acute disease; and the Physicians being called, bled him, and prescribed a very thin diet with the most dilute drinks, by which the unhappy man was so much weakened that he was almost ready to expire, and yet in the mean time the violence of the fever did not much abate. Another Physician who usually had the care of this patient, and who often shared with him in his drinking-bouts when he was in health, having been absent for some days, returning again visited his friend, and upon coming into consultation with the rest of the Physicians, said laughing, that he only well knew in what sort of pickle this body ought to be preserved, to prevent it from putrefaction; and therefore forthwith he ordered a cup of strong Rhenish wine and some flesh broth to be given him. The patient very willingly complied with his friend’s advice, and by thus recovering his strength escaped in a little time from a dangerous disease. It is therefore with the greatest reason
 that

that Hippocrates says ^b, *Morbos cognoscimus autem edocti ex communi omnium natura, & cujusque propria*: "That we become skilled in diseases by
" learning the nature of all mankind in general,
" and of every one in particular;" for the mistake of the Physicians lay in this, that they had not duly attended to the peculiar nature and custom of the patient. Hence Celsus concludes ^c, *Eum, qui propria non novit, communia tantum intueri debere: eumque, qui nosse propria potest, illa quidem non oportere negligere, sed his quoque insistere. Ideoque, cum par scientia sit, utiliore tamen medicum esse amicum, quam extraneum*. "That he who is not
" acquainted with all the particulars relating to the
" patient in his disorder, must be obliged to conduct his practice only by generals: but if he
" can be acquainted with things more peculiar or
" minute, he ought not to neglect them, but to
" insist upon them also; and therefore in two
" people of equal knowledge, a friend may be a
" better Physician than a stranger."

But Hippocrates ^d also observes, that the different habit or constitution of the patient may conduce much towards his being more or less able to sustain abstinence: for they cannot be easily supported by such people as abound with bile, and are frequently troubled with bitter ructus's, (which he calls *ἀνω πικρόχολος*) and on the contrary says, Abstinence is more easily tolerable to the phlegmatic.

7. A careful observation of what hurts or helps in diseases has been always of the greatest use, and it seems very probable that the first principles of the art of healing were thence derived, as Celsus ^e

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^b Epidem. 1. Charter. Tom. IX. pag. 80.

^c In fine Præfationis, pag. 19.

^d De victu acutorum, Charter. Tom. XI. pag. 55, 56.

^e In Præfatione, pag. 9.

very well observes in treating on the empirical sect of Physicians. For when sick people, who lay without the help of Physicians, ventured some of them to take aliment, and others abstained from it, some taking food in the fever itself, others a little before it, and others again after the remission thereof; it was observed that those fared best who took their food after the end of the fever. *Hæc similiaque cum quotidie inciderent, diligentes homines notasse, quæ plerumque melius responderent: deinde ægrotantibus ea præcipere cepisse. Sic medicinam ortam, subinde aliorum salute, aliorum interitu, perniciofa discernentem a salutaribus.* “As these and
 “such like occurrences fell out daily, those which
 “answered best were remarked by diligent men,
 “and then they began to give the same advice
 “to other sick people. And thus medicine arose
 “sometimes by the health or recovery of some
 “people, and from the destruction of others, ’till
 “it became able to distinguish the pernicious from
 “the salutary effects.” Nor is it to be supposed that the art should be acquainted with these methods at its first rise, and yet be wanting of them at present, after it has been promoted through so many ages, and illustrated with so many beautiful discoveries. Indeed there are many things still unknown, and will long remain so, all which are yet required to be known to render us able at all times to determine from the causes the effects of those things which are applied to the patient, agreeable to the rules of art. But this rule is the least fallacious of all which immediately discovers the errors as soon as committed. For if too great a quantity or too strong food is taken into the body, the patient will soon after find an uneasiness, by which we know that either the quantity or strength of the food ought to be lessened. But if the patient

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tient easily bears the food it may be prudently increased, according as the greater or less weakness and different state of the disease may require. Hippocrates, after giving some very good instructions with respect to the diet of sick people in his book *De prisca medicina*^f, and having remarked that Physicians may commit as great errors by excess or defect, has the following passage most worthy to be regarded. *Oportet autem modum quemdam conjectura assequi. Modum autem neque pondus, neque ullum alium numerum, ad quem omnia referens accuratè scias, non invenies alium, quam corporis sensum. Quocirca operosum ita accuratè condiscere, ut parum hinc aut illinc pecces. Quanquam ego hunc medicum vehementer laudaverim paucum peccantem. Exactam vero certitudinem perspicere raro contingit.* “ But some rule ought to be
 “ found to guide our conjectures ; but neither the
 “ rule of weight, nor of number, nor any other
 “ way to which all other things are referred and
 “ accurately known, will here suffice ; nor will you
 “ find any other rule than the sense of the body.
 “ For this reason you ought accurately to learn by
 “ a laborious observation neither to offend much
 “ by excess or defect. I should therefore greatly
 “ recommend the Physician whose error in this
 “ respect is but small ; for to attain to an exact
 “ certainty rarely happens.” No one therefore need be ashamed to learn by a careful observation in patients, whether or no he has committed any error in prescribing the diet suitable in fevers, by remarking the sense of refreshment or uneasiness following after the taking of the food.

These are the chief things to be considered with regard to the strength and quantity of the food to be administered to febrile patients ; and by the

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seven

^f Charter. Tom. II. pag. 156.

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seven rules comprised in this aphorism all error may be avoided, as far as is possible by art, as it is known at present. But by all these ways the powers of the febrile patient are supported, inasmuch as they supply the necessary quantity of healthy humours, or of what is nearly of the same nature: and these are usually called cordials, a word less proper indeed, but received into practice. But there are other cordials, as they are termed, whereby the too weak action of the vessels upon their humours is increased, and the too slow motion of them through the vessels augmented. The first sort of cordials are usually termed repletive, and the latter sort are called stimulating. But since generally the humours have too violent motion in fevers, there is not so often occasion for stimulants. But if the febrile motion should be so low or weak before the concoction, that the force thereof is not sufficient to dissolve the coagulum in fevers, then these stimulating cordials are serviceable. But how it may be known in the cure of fevers, that stimulating cardials are necessary, will be declared hereafter at § 609. N^o. 3, and § 611, where we shall treat of those which are best adapted for this intention.

We come next to treat of the cure of fevers by removing the stimulus, or coagulum, or both, which produce the fever, preserving life entire. We shall first treat of stimulants, which are either such as are applied external to the body, or lodged internally, whether taken into the body, or else formed there by a corruption of the healthy humours. The next aphorism then will teach what is to be done, when the cause of the fever is something acrid or irritating lodged without the body.

S E C T.

S E C T. DCIII.

EVERY thing acrid or irritating externally applied to, or adhering in the body, such as sharp-pointed fragments of metal, glass, wood, stone, bone, or any stimulating, inflaming, corroding, blistering caustic, destroying or poisonous matter of any kind, must be removed as soon as possible, when known or discovered; and then the place where they lodged, and which they injured, must be fomented with lenient, mucilaginous, soft, oily, anodyne, and gentle aperient medicines.

These acrid substances, which may be externally applied to the body, are either such as may injure and irritate the parts by means of their rigidity and figure, whereby they are enabled to communicate the motion impressed upon them by very few points; and such are usually called mechanical acrids, because the action of them may be easily understood from the common laws of motion to which all bodies are subservient; as when, for example, when a sharp-pointed fragment of glass, metal, or any other such like substance is thrust into some soft part of the body. But there are moreover other substances, which only externally applied, inflame, irritate, and sometimes destroy the parts, though such effects do not seem capable of being derived from their figure, hardness, density, &c. For that which is so active in these bodies, is often of so small a bulk, that it escapes every one of the senses; so that we cannot know
any

any thing certain of the figure, points, or the like of these particles. But because the like effects often follow from those invisible particles, which are observed to be produced by those that injure by a mechanical acrimony, therefore many have been pleased to ascribe and suppose the same figure, hardness, &c. to the particles of these bodies. But their opinion lies open to many difficulties, for cantharides applied externally to the body excite an inflammation, and dissolve the very tender vessels which connect the cuticle to the skin, and if left upon the part too long they cause a deep ulceration with extreme pain. If now it be said, that these insects abound with small particles which are rigid and sharp-pointed, and which, being put in motion by the heat of the body to which they adhere, cut asunder the very minute vessels, it may be asked why the same particles, moving through the minute vessels of the living insect itself, did not destroy them in the like manner. When a viper has made a small wound with his tooth, and injected some of its poison, the most severe inflammation, fever, anxiety, &c. and often Death itself follows : and yet this poison both as to taste and colour comes nearest in resemblance to oil of almonds, manifesting little or no acrimony to the senses ; and what is more, this, which is so dangerous a poison, when mixed immediately with the blood, is nevertheless swallowed without any bad consequence (see the comment to § 155.) But it is sufficient for the Physician to know what these and the like substances applied to the body can effect, and to be acquainted with the remedies whereby the injuries thence following may be removed or corrected : nor will it be any disgrace ingenuously to confess his ignorance of those things which are not yet understood, since the most plausible hypotheses

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theses do not answer and agree with all the appearances, and it is often dangerous to derive rules from such hypotheses, to direct us in what is necessary for the removal of the injuries. Now these acrid substances, whose effects we know by observation, but whose manner of action we are often unacquainted with, do frequently produce very different effects, according to their different strength and the time in which they continue to be applied. The milder kind of these stimulate the parts but slightly, and then produce a slight erysipelas, and are therefore called rubefiers, because they introduce such a colour into the skin. But the more acrid of these, or even the former, left a longer time upon the parts, raise the cuticle into a blister, and corrode the skin. But cauteries, if actual, immediately destroy the part to which they are applied, and change it into a dead eschar or scab; and even the potential cauteries produce the same effects, though more slowly. But there are some things which not only destroy the continuity of the parts, but at the same time dispose them to the worst putrefaction, and change the whole into a most stinking corruption, as is evident from what has been said before at § 425. Thus the lixivium of quicklime, which does not seem very acrid to the taste, being mixed with the most healthy humours, as urine for instance, immediately causes them to exhale a most volatile and caustic salt, like unto that which is produced by putrefaction. The imprudent application of corrosive sublimate to consume an external tumour, has converted all the humours of the body into the most ill-smelling corruption (see the comment to § 586, N^o. 4.) But as these external acrid substances have so great a malignity, they are therefore justly termed poisonous.

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When therefore it appears by a careful examination, that the cause of the fever proceeds from such things externally applied, the only cure is to remove them immediately; for since even by these a fever may be excited in the most healthy body, it is very evident that no other method of cure remains. This Diemerbroeck^s had an opportunity of observing in many patients, who believed themselves taken with the plague, because they had an oppression at the heart, with an internal heat, and in the middle of their breasts found blackish coloured pustules: but that knowing Physician readily perceived that these were no symptoms of the plague, but of an amulet of arsenic, which was sold by impostors at an high price, as a certain prophylactic or preservative, and which being applied to the breast had produced these complaints, and therefore by immediately throwing aside the amulet, he happily set them at liberty from imminent danger.

How sharp-pointed fragments of metals, stones, &c. which injure by a mechanical acrimony, ought to be removed, and what things are to be observed in the performance thereof, has been already declared in the history of wounds (§ 186 to 189); and these being removed, the rest of the cure may be understood also from the cure of wounds. But when the fever proceeds from other acrids, as for example, cantharides, arsenic, or the like, greater caution is required; for frequently the minute particles of these, namely, if they were reduced into and applied under the form of a fine powder or meal, lodge themselves under the scales of the cuticle, and still continue to exert their virulence; whence a very careful washing and cleansing of the part affected is necessary.

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^s De peste Lib. IV. cap. 99. pag. 319.

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Moreover, the part injured is often excoriated, or deeply corroded, and the nervous part of the skin becomes irritated and painful by the touch of every thing that is the least acrid, insomuch that frequently it cannot bear the contact of the air, without extreme pain, whence inflammation and fever frequently follow. Therefore the part ought to be tomented with the most emollient decoctions, such are those best made of marsh-mallows, mallows, mullen, linseeds, quince seeds, and the like mucilaginous substances. The most emollient ointments, as of poplar, roses, &c. are used for the same purpose, and anodynes are likewise added to these, to abate the troublesome sense of pain in the part. And if at the same time all the parts are relaxed by the fomentations, they are by that means well disposed to make an easy expulsion of any part of the acrid matter, which may still adhere. Forms of these remedies may be seen in the *Materia Medica* of our author at the number corresponding to that of the present aphorism.

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SECT.

S E C T. DCIV.

THE acrid irritating matter lodged internally, whether arising from an inflammation, suppuration, gangrene, sphacelus, cancer, caries of a bone, ichor, pus, or sharp and stagnant lymph, ought to be removed or corrected, agreeable to the rules before given in the history of these diseases already premised. If any acrid and poisonous, or epidemical contagion be received into the body, so as to irritate the vital powers, it ought to be treated agreeable to the rules laid down for epidemical diseases (§ 1407 to 1412).

But when the acrid irritating matter is lodged internally, the cure is more difficult, as the part affected does not come under the observation of the senses, and topical medicines cannot always be applied so as to extend with their virtues entire to the affected part; and yet in the mean time a removal of this acrid matter lodged internally is absolutely necessary for the cure of such fevers; and hence appears the reason of the greater difficulty which attends their cure. In the next place, the principal kinds of this acrimony are enumerated.

From an inflammation:] That a fever is an inseparable companion of inflammation, we have already seen in the comment to § 558. And when the smallest vessels being stopped up with impervious humours, are urged by the impetus of the blood acting behind, there follows a distraction of the small nervous fibres, from whence we observe
 pain,

pain, and at length a separation of the continuity, with almost all the other effects which follow from the application of acrids externally. Helmont was therefore in no great error, when he considered a pleurisy as a thorn fixed in the intercostal membranes, and he says, that the pulling out this thorn makes the cure of the disease (see the comment to § 396. N^o. 2.): but this thorn was not an hostile acid as he believed, but a dense inflammatory matter impacted into the extremities of the smallest arteries, and which, in vain, he attempted to remove by his specifics. But a fever arising from an inflammation cannot be removed, unless that matter is resolved; for when the inflammation turns to a suppuration or a gangrene, the fever continues, and is even increased. Hence those have been grossly mistaken, who have endeavoured to cure the fever which attends acute inflammatory diseases by the Peruvian bark; for although the violence of the fever might be thus kept under, yet the same stimulus remaining will immediately after renew the fever again. The only cure therefore for such fevers is by resolving the inflammation; and yet this resolution of the inflammatory matter in the cure of intermitting fevers, by too much weakening the body, does great mischief.

[Suppuration.] In the comment to § 387, we saw that the fever, pain, and other symptoms of the inflammation, when being incapable of resolution, it turned to suppuration. But although, as was there observed from Hippocrates, all the symptoms are worse while the matter is forming than after it is completely made; yet unless that matter can be evacuated which is collected in the internal parts of the body, it becomes attenuated, acrid, and putrefying, erodes and inflames the adjacent parts, is then absorbed by the open mouths of the
small

small eroded veins, infects the blood, and kindles the very worst kind of fevers (see § 406.) never curable, unless the purulent stimulus can be corrected and expelled. In consumptive people, whose lungs waste away by a slow suppuration, there is a continual slight fever, which often increases every day at the time when fresh chyle is plentifully supplied and driven together with the blood through the lungs: some people therefore, believing this fever to be of the intermitting kind, have made trial of the virtues of the bark, but always with the most fatal success; for the purulent sources remaining, they in the mean time suppress the febrile motion, whereby the collected matter ought to have been expelled, whence the greatest anxieties and sometimes death itself has followed from that practice. For the whole cure of such a disorder consists in washing out as it were, and detaching the purulent matter, and then to consolidate the parts thus cleansed from the matter, as in the cure of a clean wound. But it is often out of the power of art to effect what the curative indication demands; because when the best decoctions for this purpose, from the roots of China, sarsaparilla, vipers grass, agrimony, betony, &c. are drank in large quantities, the patient's strength cannot support them, but they run off immediately into profuse sweats, with a great and sudden dejection of the strength, or sometimes they run off with equal violence and danger by stool. For unless the powers are sufficiently strong, the patient cannot be able to take, retain, and circulate so great a quantity of these decoctions, through all parts of the body; hence therefore matter will be accumulated and renewed every day in the affected part, if it is not expectorated; whence the fever increases, and the body being consumed, at length expires juiceless and tabid.

Gangrene, sphacelus, &c.] For if laudable matter only by heat and stagnation corrupts in the part where it is confined, and being absorbed by the veins may kindle the worst fevers, much more may the same be feared from the gangrenous ichor and putrefaction of parts corrupted by a mortification. Add to this, that a separation of a gangrene or sphacelus can never be obtained unless the margins of the adjacent living parts suffer an inflammation, and then suppurating divide the dead from the living; and thence again a fever arises. What injuries arise from a cancerous ichor, and what enormous pains and fevers are excited, while the living parts are gradually corroded thereby, has been declared before at § 499. as also what maladies ensue the worst putrefaction in a corruption of the bones, and more especially of their contained marrow (§ 526.) If therefore fevers arise from irritating acrimony produced by these maladies, it is sufficiently apparent that the cure of those fevers will depend upon the cure of those diseases, concerning which we treated more at large in the history of each.

Sharp and stagnant lymph.] The lymph is often accumulated in the larger or smaller cavities of the body, as we shall hereafter explain more at large when we come to treat of a dropsy; and as the lymph is at first mild and without acrimony, it offends only by its weight and compressure. But by long rest the lymph gradually corrupts, and turns acrid so as to erode and inflame the containing parts; and partly from this cause and from the absorption of the putrid ichor by the bibulous viens, a fever of the worst kind is excited, in which there is intense heat, although the dropsy is in its own nature a cold disease. The cure of such a fever requires an expulsion of the acrid and stagnant lymph, or a correction of the putrefaction

already formed, and a prevention of it for the future. From hence it is also evident that bitters, alkalies, strong spices, &c. which are so useful in the beginning of a dropsy, do great mischief when the stagnant lymph is once begun to putrefy.

Epidemical acrid, &c.] The several kinds of acrimony before enumerated which by their stimulus excite a fever, may be reduced to some known class of acrimony, for which we are provided with the most efficacious remedies. But fevers which arise from an epidemical acrid, or a poisonous contagion, are much more difficult to be understood and cured. But although the subtlety of these is such that they manifest themselves only by their most malignant effects in the body, yet because they irritate the vital powers with a great force, therefore they are usually called acrid, though it does not seem easy to reduce them to any known class of acrimony. The only method with which art is provided for curing these diseases, (unless a specific antidote for them should happen to be discovered) is by a careful observation to discover what ways nature, irritated by these stimuli, makes use of to destroy their force, or expel them from the body; and then to imitate and forward as much as possible these salutary endeavours of nature. For we know nothing à priori of these causes, but all the curative indications arise from the nature and history of the disease being known throughout its whole progress. But what rules are to be observed in discovering such diseases, and in finding out their latent dispositions, will be explained hereafter when we come to treat of epidemical diseases under their particular head.

S E C T. DCV.

THE acrid irritating matter introduced into the humours themselves by use of the six non-naturals, may and ought to be removed or corrected by different remedies, according to its own and different nature.

It has been customary with physicians, in discovering the remote causes of diseases, to assist their memories by proceeding methodically and reducing them to certain classes, under the title of non-naturals; calling them so because by the use or abuse of them, they may be good and natural, or bad and against nature^b. But generally the non-naturals are used to be comprised under six heads, namely air, food and drink, motion and rest, passions of the mind, things retained and discharged, sleep and vigilance. But by running through each of these by themselves, we enquire whether the present fever in the patient arises from one or more of these causes, and when this has been discovered, it may be easily determined what remedies will be convenient for the cure of a fever whose cause is thus known. For in fevers arising from an abuse of the six non-naturals, a skilful physician may be of very great service; when on the contrary he is obliged to perform only the part of a spectator in those fevers which arise from an epidemic or poisonous stimulus, until by a careful observation he has learnt the genius and course of the disease, with the various endeavours of nature; because the nature of such a stimulus can only be

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known

^b Herm. Boerh. Instit. Medic. § 745.

known by the effects which it produces in the body of the patient; therefore the dignity or usefulness of this discovery of the causes directing to the cure of fevers calls for a consideration of them under each of the following heads.

1. Those which arise from too much exercise or motion, are cured by rest of body and mind, with such aliments and medicines as moisten, dilute, and soften or allay acrimony.

We have already seen in the comment to § 585. N^o. 3. that acute and mortal fevers may arise from too violent exercise of body. And if we consider the effects which follow in the body from too great motion, the reason will be evident why only the remedies reckoned up in this number are of service. For by violent motion of the body, the velocity of all the humours is increased, since the contraction of the muscles quickens the motion of the venal blood towards the heart, whence one of those causes (and a very powerful one) producing the heart's motion is increased, since even thereby the motion of the heart may be renewed in a dead body, as we said before in the comment to § 574. But the veins being thus depleted, the arteries more especially propel their contained humours through the smallest extremities, into the now less resisting veins, and therefore the velocity of the circulation will be increased thro' all the vessels. But this cannot be performed without applying the humours oftener, or in a greater quantity, to the secretory organs in the same time, whence the more fluid parts of the blood will be dissipated, and especially in sweats; thus what remains will be inspissated, and by the greater action of the
vessels

vessels upon their contained fluids, and of the reacting fluids upon the vessels, the blood acquires an inflammatory density. Add to this, that by the violent attrition of the solids and fluids together, with the heat thence arising, all the humours will incline to a greater acrimony, and the salts and oils of the blood will become more acrid and volatile, see § 100. This we are also taught by the urine, which being discharged after violent exercises of body is observed very red, acrid, scalding, and strong smelling. The first thing therefore required here is to allay the too great motion of the humours by rest of body and mind; for it would be in vain to hope for a cure, if the cause producing the disease continues to act. Hence Hippocrates¹ observes; *In omni corporis motu, quum id laborare cæperit, quies statim lassitudinem levat.* “That whenever the body begins to be indisposed from any kind of motion, rest immediately relieves the weariness.” And we even see that those who have been tired with too much motion, naturally give themselves over to rest, and often refuse their food by too great weariness. Hence Celsus² says; *Si quando tamen insuetus aliquis laboravit, aut multo plus, quam solet, etiam is qui assuevit, huic jejuno dormiendum est: multo magis, si etiam os amarum est, vel oculi caligant, aut venter perturbatur. Tum enim non dormiendum tantummodo jejuno est, sed etiam in pesterum diem ita permanendum, nisi cito quies id sustulit.* “But when a person has laboured who has not been used to it, or if more work has been done than usual by a person who has been even accustomed to labour, such a one ought to sleep with an empty stomach, and much more so if there is a bitterness of the mouth, a dimness of

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¹ Aphor. 48. Sect. II. Charter. Tom. IX. pag. 86.² Lib. I. cap. 3. pag. 25.

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“ the sight, or a disturbance in the bowels. For
 “ then he must not only sleep fasting, but continue
 “ so for the next day, unless rest soon removes
 “ his complaints.”

But these bad symptoms happen more especially when the bile, being rendered acrid by too much exercise, fluctuates in too great a quantity about the præcordia : And from hence at least it is evident that rest is the chief remedy to be used after too much exercise ; and therefore a little after he says¹ in the same chapter, *Post iter, primum sedile, dein unctio*, &c. “ After travelling on foot, the
 “ person must first rest and then use unction,
 “ &c.” But since commotions of the mind may excite a much greater velocity in the circulation than motion of the body (§ 586. N^o. 3.) the reason is evident why rest of mind is also highly necessary. But because the mouths or beginnings of the vessels are too much dilated by excess of motion (see § 100.) therefore the grosser humours will enter the smaller vessels by an error of place ; but this is a disorder which will be removed by rest : For when a less force urges behind, the vessels contracting by their natural strength repel back the erroneous particles into the larger trunks, whence the obstruction arising from this cause is resolved. This effect is apparent even to the eye in those who by violent running look red all over their body, from the entrance of the blood into the smaller cutaneous vessels, but after they have rested for a time, that redness abates, and at last the body recovers its natural colour.

It now remains for us to see what helps are required to restore those parts of the humours which were wasted by excess of motion, and to correct the

¹ Lib. I. cap. 3. pag. 27.

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the defects which follow from thence: But this is done by

Such aliments and medicines as moisten.] For by too much motion of body the most liquid part of the humours is dissipated, and the rest consequently becomes drier and thicker: Therefore every thing that is moistening proves in this case most useful, whether internally taken or applied to the external surface of the body. Hence *Ægineta*^m directs those who have a fever from weariness, to rub themselves gently with oily or fat substances, and to go into the warm bath: And *Trallian*^a directs all those methods to be taken which may rather increase the moisture than exhaust it out of the body. Therefore he only recommends gentle friction, because more violent increases the motion, and then to anoint the whole body with water and oil, and to cherish it afterwards in the warm bath. The like advice is also given by *Celsus*^o.

Dilute.] What diluents are and how they act, has been said before in the comment to § 132 and 134. But by excess of motion, as was said before, the most fluid parts are dissipated, and the particles of the blood being compacted together, by a greater action of the vessels upon their humours, become impervious; and therefore both these effects require diluents, inasmuch as they restore the particles lost, and by their interposition betwixt those of the blood, prevent their mutual contact and cohesion. But diluents act the best of all if they are made warm (see § 134.), for cold things, whether drank or applied to the external surface of the body, after it has been heated by violent motion, may do great damage (as was demonstrated in the comment to § 118.) The same thing is

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also

^m Lib. I. cap. 16. pag. 18. versa.
pag. 671.

^o Lib. I. cap. 3. p. 25.

^a Lib. XII. cap. 1.

also carefully advised by Celsus when he says ; *Illud quoque nosse oportet, quod ex labore sudanti frigida potio perniciosissima est : atque etiam, cum sudor remisit, itinere fatigatis inutilis.* “ It ought also to
 “ be observed that drinking of cold liquors is ex-
 “ tremely pernicious in a person sweating by la-
 “ bour ; And also that it is not useful even after
 “ the sweat is abated in such as have been tired
 “ by travelling ^{p.}”

Soften or allay acrimony.] For since excess of motion renders the salts and oils of the blood more acrid and volatile, therefore softening and sheathing substances, which obtund all acrimony, will be of the greatest use ; and more especially such of these as are by their own nature inclined to resist all putrefaction, as are all mealy substances. Hence decoctions of oats, barley, whey, milk and water, and the like, are of the greatest service in these cases. By all these means the most violent and inflammatory diseases which are used to arise from too much motion of body, may be frequently prevented. Therefore in Asia the inn-keepers take the wearied travellers into a warm bath, then supply them plentifully with drinks made warm, and at length with food consisting almost entirely of grain and garden-fruits, and then at last they are well refreshed by sound sleep.

2. Such as arise from too intense heat of the air are best cured by moderating that heat, by the exhalation of cold things, especially some plants proper for this purpose, and by the drinking of water nitrated a little acidulous, or rendered subacid with a little wine, by subacid and balsamic food very little salted, and medicines of the like nature.

For

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For by too great heat of the air we know that the most fluid parts of the blood are dissipated, and the small vessels dried up. Every one has experienced this who has travelled in the summer-time thro' a sandy country; for the nostrils, eyes, internal parts of the mouth and fauces, then become extremely dry; and therefore almost the like maladies are to be expected as follow from too much exercise or motion of body. But the very speediest degeneration of the humours into the worst putrefaction is observed in a very hot air. This is very well demonstrated by experiments in the chemistry of our celebrated author¹, who procured healthy living animals to be detained in a place the air of which was 48 degrees hotter than the blood of a healthy child. It then appeared that in about the space of 28 minutes the animal was suffocated, and had acquired so great a degree of putrefaction that no body was able to bear the intolerable exhalation, the horrid smell of which so much indisposed a hard-labouring-man that he was in danger of present death. It is indeed true that the heat of the air in summer, even in the most sultry and scorching heats, never arises to so great a degree; but yet it may nevertheless appear from hence how much a hot air tends to promote putrefaction. Thus we also know that in the summer time the flesh of animals killed very speedily corrupts.

The cure therefore of the acrimony arising from this cause will be obtained, by removing the cause itself, and correcting those changes which have been introduced in the body by the heat of the air.

By temperating the heat with cooling exhalations.] It would indeed be extremely dangerous to apply cold suddenly to the body, after it has been heated

¹ Elem. Chem. Tom. I. pag. 275.

heated by the air; for nothing does more mischief than sudden alterations from heat to cold. Hence in the summer-time, when the air is suddenly cooled after intense heats, often attended with thunder, great rains, and sometimes hail, pleurifies, quinifies, and the like inflammatory diseases, invade careless people. I saw an unhappy man, who to avoid the scorching heat of the air, continued for the space of two hours in a deep cellar, being pleased with the agreeable, but deceitful coolness of the place, for he was taken up almost half dead, with a stiffness throughout his whole body, and afterwards was severely punished for his imprudence by the most obstinate rheumatic pains, from which he with much difficulty escaped after several months. It is therefore necessary to temperate the too great heat of the air very gradually, as it may be by the power of the physician: For cold water drawn up, especially from a deep well, and sprinkled on the walls and floor, affords a safe and pleasing coolness. And since it is in our power to increase the cold of water almost at pleasure, by adding to it sea-salt, sal-ammoniacum, and nitre, which salts cause a great degree of cold in the water during their solution, as we learn from chemical experiments, it is therefore evident that thus the too great heat of the air may be easily moderated.

More especially some plants suitable for this purpose.] The celebrated Dr. Hales* has demonstrated by the most accurate experiments, that plants drink in and expire again an incredible quantity of water, and therefore this may be the best artifice of dispersing water through the air; as when, for example, branches cut off from a willow are placed in wet sand. There are also some plants which exhale an agreeable fragrantcy together with water, by which

* Vegetable Staticks, cap. 1.

which they afford a pleasing coolness: the flowering branches of elder serve very well for that purpose; but they do not flower throughout the whole summer-season. Yet many more plants of other kinds may be substituted in their stead; as for example, the barbary-bush, meadow-sweet, roses, &c. which abound with such a fragrancy. And thus not only the too great heat of the air is qualified, but as the same air is moist as well as cool, before it is inspired and touches the whole surface of the body, it will also remove the too great dryness arising from heat.

By drinking water subacid and a little nitrous.] Too great heat of the air disposes every thing in the body to putrefaction, and therefore such a drink is necessary as very much resists putrefaction. But acids have this resisting power; and therefore these diluted with a large quantity of water, that they may not injure by their stimulus when they are very strong, will very well answer this intention. A small quantity of nitre is likewise added, because it is not only a powerful antiseptic or cooling medicine, but also attenuates the inflammatory spissitude of the blood, which is feared. Thus a large quantity of water, being taken into the body with these ingredients, will be of great service in diluting the humours, and relaxing the vessels, and will at the same time afford a vehicle for the urine, whereby the salts and oils already become too acrid, are naturally discharged from the body.

Mixed with a little tart wine.] It is a vain fear entertained by some, that every thing bad may happen from the use of wine in fevers, because it is supposed that the heat is thereby always increased. Strong wines indeed, especially if taken in a large quantity, certainly heat the body too much; but wine diluted with a large quantity of water recruits
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the languishing powers, and yet is not prejudicial by stimulating. Even a much more agreeable coolness is perceived from the drinking of wine diluted with a great deal of water, than of water only. In ardent fevers Hippocrates* orders the patient to be supplied with old wine of Thasos diluted with twenty-five times as much water. But tart wines are more especially recommended here, because they resist all putrefaction: for thus we know that the flesh of boars being covered with Rhenish wine is preserved from corrupting. Add to this, that as people languish or faint from too great heat of the air, therefore a moderate quantity of wine diluted with water will very well relieve this complaint, and at the same time better distribute the water throughout every part. Hence Helmont, in opposition to the Galenical physicians of his time, who condemned the use of all wines in fevers, stands up not without reason, and says, *Vinum autem peculiarem habet indicationem: non solum quia vires addit, quibus natura exosam materiam domat; verum insuper quod sit plastrum medicaminum conveniens. Est nimirum nuntius, qui vias novit, itineri accinctus, charus intimis, & admissus in penetralia.* "That wine is peculiarly called for, not
 " only as it adds to the strength whereby nature
 " may tame the offending matter, but also as it is
 " the most convenient vehicle to the medicines.
 " It is moreover a messenger well acquainted with
 " the ways, and well provided for the journey it
 " is to take, beloved and admitted by nature into
 " her inmost recesses and penetrable parts." Now according to the greater or less strength of the wine, it may be diluted with more or less water, so as to make the most agreeable drink: as when, for example,

* De Morbis Lib. III. cap. ultimo pag. 595. Charter. Tom. VII. † Helmont. de Febribus cap. 12. N^o. 7. pag. 773.

ample, five or six quarts of barley-water are mixed with one part of tart wine, to which is added a small portion of nitre and citron juice, wherein the jelly or juice of currants, elder-berries or the like boiled up with sugar may be also diluted, a form whereof may be seen in the *Materia Medica*, at the number corresponding to the present aphorism.

By subacid and balsamic food a very little salted.] As the stronger decoctions of barley, oats, rice, &c. with the additions of the juice of citrons or oranges: likewise fresh gathered and tart summer fruits, as cherries, currants, strawberries, tart apples boiled, and the like, dissolved in the preceding decoctions, make an exceeding good and pleasant food in this case. Skimmed milk and the whey of milk boiled with the like fruits are also very useful. Nor can it be hurtful to add a small quantity of salt, more especially in those mealy foods which are displeasing to the taste without, provided care be taken not to add so great a quantity, as will increase the febrile motion by a stimulus. But if any one has not a good opinion of the use of salt in these cases, it may be sufficient to season the food only with the juice of citrons or oranges.

And by medicines of the like nature.] Watery liquors are here convenient, inasmuch as they relax, dilute and mitigate acrimony, while at the same time they afford a vehicle to the sweat and urine for discharging out of the body whatever is acrid and offensive. But water of itself too soon runs through these passages, before it has sufficiently moistened the dry parts of the body, which have been parched with heat; and therefore mealy substances are prudently added to the water, which nourish and communicate a mild tenacity; and at the same time, by their natural inclination to acidity, they resist all putrefaction. But as by heat
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the most liquid parts of the blood are dissipated, and the rest more inclined to thickness and cohesion, therefore saponaceous dissolvents are given, but such as are either acid or indeed inclined to acidity, as the juice of elder-berries, currants, mulberries, and many of the like kind, of which there is usually variety enough to be found at the shops of confectioners. But since the acrimony of the bile is always observed to increase by too much heat, such things are also commendable, which by a gentle stimulus carry off the bilious matter from the primæ viæ, as tamarinds, crystals, and cream of tartar, sal polychrest, &c. If now at the same time there is a local inflammation, because the blood deprived of its passage stagnates in the ultimate extremities of the arteries, then every thing recommended in the cure of an inflammation must be used; more especially nitre, sal prunel, &c. are here recommended, whose cooling virtues are very well known. Hippocrates in this case made use chiefly of oymel, mead and barley-water, which are certainly the best, as they are the most simple liquid medicines. Now from these may be formed various other medicines, specimens of which may be seen in the *Materia Medica*, at the number corresponding to the present aphorism.

If now violent exercise of the body concurs together with too much heat of the air, the most malignant and dangerous fevers arise, as frequently happens when soldiers are obliged to make long marches in the scorching summer heats: for then commonly happen very putrid and spreading camp-fevers, in which the same diet and remedies, as before mentioned, are proper. Hence it was a salutary custom among the ancients to make the soldiers drink vinegar and water to prevent these diseases: And sometimes the generals have given strict orders

for no wine to be drank by any body in the expedition, but for every one to be content with vinegar.^u

3. Those which arise from a too moist air are to be cured with large fires made of resinous and aromatic woods, and also by the exhalations of spices.

That the air is always moist, and contains water in itself, although it may seem dry, we are taught by those bodies which deserve to be termed watery magnets, because they attract water from the air: such are the strongest acids, as rectified oil of vitriol, very dry alkaline salts, decrepitated sea-salt, &c. for all these being exposed to the air in the summer-time, however warm and dry it may seem, do nevertheless increase their weight and dissolve; and one may then be able to distil over by the force of fire all that they attracted from the air, which, for the most part, is only meer water. But when water abounds in the air, it is then said to be too moist: but the different degree of moisture is pointed out to us by hygrosopes. But now different changes will happen in the human body according as this moisture of the air is accompanied either with heat or cold. For a cold and moist air, with respect to the water which it contains, and applies in a great quantity to the surface of the body, will dissolve and relax, while in the mean time the cold contracts and shuts up the mouths of the exhaling vessels, so as to obstruct the perspiration, and cause a serous defluxion internally, whence coughs, catarrhs, serous peripneumonies, &c. But if the moisture of the air is accompanied with great heat,
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^u Nonnius de re cibaria Lib. IV. cap. 15. p. 479.

it excites the most sudden putrefaction, as is evident in the flesh of dead animals, which being exposed for the space of a day or two in such an air, dissolve into a putrid mass. Hence it is, that physicians have in all ages condemned a warm and moist air, as containing something of a pestilential quality. Thus it has been observed, *Europæcs, qui loca America primi obsidebant, omnes fere morbo Endemico periisse per malignum morbum, qui corpora brevissime dissolvebat putrida quadam febris specie. Id autem imprimis accidisse illis omnibus, qui loca incolebant arboribus & fruticibus obsita* ". " That
 " the Europeans, at the first settling of their colonies in America, most of them perished with
 " a malignant epidemical distemper, resembling a
 " kind of putrid fever, which dissolved the bodies
 " in a very short time. But this happened more
 " especially to all those who inhabited places
 " bounding with trees and shrubs." For trees and other plants exhale an incredible quantity of water : and therefore afterwards, when they had removed this exhaling humidity by burning up the woods, the air was rendered perfectly healthy, although the climate continued equally hot as before.

Since therefore this moisture of the air is so prejudicial, it ought to be particularly corrected, as it may be more especially by fire, which effectually dries every thing ; and particularly a fire made with aromatic and resinous woods, such as guaiacum, mastic, juniper, cedar, and the like ; for by this means there is also diffused through the air at the same time that excellent antiseptic acid, resisting putrefaction, which, as we are taught by chemistry, lies contained together with the aromatic fragrancy in these woods. But if these woods bear any considerable price, the chips and fragments left
 after

after working of them may serve for this purpose: otherwise oak-wood alone, which may be had at a price cheap enough, will suffice for this indication. It will indeed seem improper to kindle a fire when the air is already very hot, but if this be done in a large and open chimney, the heat will not be so much increased, and in the mean time the too great moisture of the air will be carried off very well.

But aromatic exhalations, though properly speaking, they do not lessen the moisture of the air, yet they prevent or correct a great many maladies arising from a too great moisture of the air, as the cause. For the corroborating force of spices corrects the too great relaxation, and at the same time powerfully resists all putrefaction. Thus it is a known thing that southernwood, wormwood, germander, rue, sage, and the like herbs, restrain putrefaction in the dead bodies upon which they are sprinkled; and parts corrupted by a gangrene or a sphacelus may be preserved by such medicines, so as to prevent the disorder from spreading. For this purpose therefore it is customary to fumigate the air by burning mastic, frankincense, myrrh, &c. or the most fragrant spices being reduced to a powder are dispersed about the place; a formula or prescription of which powder may be seen in our author's *Materia Medica* corresponding to this number.

4. Such as arise from an acrid putrefying air must be corrected by the firing of gunpowder or nitre, the steams of vinegar, or the sprinkling of common salt upon burning coals.

By the air we understand that thin fluid with which we are invested on all sides, and whose gravity, elasticity, and other general qualities have been

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 beautifully searched out and examined experimentally by mechanical philosophers. But in this ambient air fluctuate a very great number of different substances: for every thing which exhales both from vegetables and animals, all that flies off from corrupting dead bodies, and every thing which is expelled from bodies of any kind by the force of fire, all diffuse themselves throughout the air. Nor must we exclude the exhalations thrown into the air from fossils, either spontaneously or by the force of fire. Hence the air is, in a manner, a chaos in which the minute particles of all these bodies fluctuate together; and therefore, with respect to the variety of bodies which the air contains, it may produce wonderful effects, more especially because it is every where present. For, as Hippocrates says, *Quid enim sine hoc fit tandem? Aut a quonam hic abest, aut cui non præsens est?* “What is
 “there that can be done without the presence of
 “the air? What place is free from it, or whither
 “does it not penetrate?” But more especially the air has a great efficacy upon the human body, not only as it invests the external surface thereof, but also as it is inspired every minute into the lungs, and conveyed through the stomach and intestines, filled with all its various particles, as long as life continues. Hence Hippocrates says, *Corpora hominum & aliorum animantium triplici alimento nutriuntur: illis autem alimentis hæc sunt nomina; cibi, potus, spiritus. Ac spiritus quidem, qui in corporibus insunt, flatus nominantur, qui verò extra corpora, aër. Ille autem maximus in omnibus, quæ accidunt, auctor est, &c.* “That the bodies of
 “men and other animals are nourished by three
 “sorts of aliment, of which these are the names,
 “food,

* Hippocrat. de flatib. cap. 2. Charter, Tom. VI. pag. 214.
 † Ibidem.

“ food, drink, and air. And the air which is
 “ confined in bodies is called flatus, to distinguish
 “ it from the air, properly so called, which is
 “ without the bodies. But this is the great author
 “ of all those changes which happen in bodies,
 “ &c.” Hence physicians have in all ages sought
 after the causes of diseases, spreading among the
 people, in the air with which we are encompassed,
Quia eundem spiritum omnes attrahunt, & simili
corpori spiritu similiter permixto similes oriuntur fe-
bres. “ Because every one draws the same breath,
 “ and the same air being mixed in the same man-
 “ ner with the bodies of people, the same fevers
 “ arise ².”

But this latent malignity in the air is known only
 by its effects, and cannot easily be reduced to any
 known species of acrimony. But such an air is
 said to be sharp or acrid, because by that the sti-
 muli are communicated to the human body, by
 which the humours are most violently moved, and
 thrown into a most acute fever; and at the same
 time there is usually in such an air a disposition often
 to a very sudden and great putrefaction, for which
 reason such an air is said to be putrefying. Some
 indeed would have this malignity of the air more
 particularly defined; but in attempting this they
 do not seem to have happily succeeded. Thus,
 when malignant diseases have been observed to arise
 from the putrid exhalations of dead bodies after a
 battle, some have therefore taken occasion to pro-
 nounce from thence, that putrid exhalations dis-
 persed through the air were always the cause of
 such like diseases. But they who tan or prepare the
 skins of animals, and such as make glue of the
 parts of animals, breathe an air filled with such
 putrid effluvia all their life-time, and yet continue

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well

² Hippocrat. de flatib. cap. 3. pag. 215.

well enough in health. Arsenic being observed by the chemists to be a most strong poison to all animals, when it has been rendered volatile by fire, therefore they have accused such arsenical fumes floating in the air as the epidemical cause. Others again have framed different hypotheses no better than conjecture, not being founded on facts and experiments. For who has been able to explain, why the plague at one time invades men only, at another time only cattle, particularly oxen, or confining itself to some other particular class of animals, though all in general breathe the same air. Hippocrates contented himself with observing the effects, and though he did not understand the causes, yet, after proposing this difficulty, he wisely says, *Corpus a corpore, natura a natura, alimentum ab alimento differt. Neque enim omnibus animantium generibus eadem sunt commoda aut incommoda, sed alia aliis conveniunt. Quum igitur aer hujusmodi inquinamentis plenus fuerit, quæ humanæ naturæ inimica sunt, tum homines ægrotant. Quando vero alteri cuidam animantium generi aer incommodus fuerit, illud morbo laborat.* “ The nature of one body
 “ differs from another, and even nature differs from
 “ herself in the same body at different times, and
 “ one sort of aliment differs from another; nor
 “ is every thing indifferently hurtful or useful to
 “ all sorts of animals alike, but some things agree
 “ or disagree more with some than others. When
 “ therefore such a kind of air is full of foreign
 “ particles, which are enemies to human nature,
 “ then mankind are invaded with sickness. But
 “ when the air becomes incommodious to some
 “ other kind of animal, that species also becomes
 “ invaded with disease^a.” This ingenuous simplicity

^a Hippocrat. ibidem.

plicity of the antients has been too presumptuously laughed at by some, who at the same time have recourse to occult qualities: but the antients did not attempt to account for those things which they did not understand, but being ignorant of the causes, they yet observed what were the effects, and distinguished them by such a denomination.

It will now be of the greatest use to see what physic has found out to destroy these latent poisons in the air, or render them inactive, or else so to defend human bodies, that they may be either less or not at all affected by these causes. The antient chemists have pronounced fire to be the death of all things, since thereby all the seminal faculty or particular form is destroyed. And we are taught by the most antient monuments of antiquity, that by fire only, they have at times endeavoured to destroy this latent poison in the air. For it is related in Suidas^b, *Quod Jachen Ægyptius, (qui diu ante Hippocratem vixit) in doloribus & morbis curandis summus fuerit artifex, & pestim grassantem extinxerit, &c. quamobrem & sumptuose sepultus fuit. Postea autem, quando popularis morbus grassabatur, ad hujus fanum sacri scribæ euntes, & sacris ritè peractis ex ejus ara ignem accedentes, & pyras per urbem incendentes, & fœtidi aëris corruptricem illum morbum exsiccantes & superantes, quod profecto maximæ novitatis est, morbum illum igne extinxerunt.* “ That Jachen the Ægyptian, “ who lived a long time before Hippocrates, was “ a great artist in the cure of pains and diseases, “ and that he extinguished a spreading pestilence, “ &c. for which reason he was sumptuously buried. “ But afterwards that when an epidemical disease “ spread, the priest went to his temple or tomb, “ and after regularly performing their ceremonies,

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“ they

^b Ad vocabulum Ἰαχὴν & ἱερογραμματισίς.

“ they kindled fires in the area round about, and
 “ made bonfires throughout the city; so that by
 “ drying up and changing what was foetid, cor-
 “ rupt, and morbid in the air, they suppressed the
 “ disease by fire, which is indeed a thing perfectly
 “ new or unheard of.” The same is also testified
 by Plutarch^c of the physician Acron, who also
 lived before Hippocrates, when he says, *Etenim*
Medici adversus pestilenciales effectus prodesse censent
multam flammam, utpote aërem attenuantem. Melius
autem attenuat, si bene odorata ligna urantur, qua-
lia sunt cypressi & juniperi & piceæ. Acronem vero
Medicum Athenis tempore magnæ pestis gloriam sibi
paravisse dicunt, jubentem ignem prope egrotantes
accendi: juvit enim non paucos. “ For fire or
 “ flame is judged to be of much service by phy-
 “ sicians against the effects of the plague, because
 “ it attenuates the air: but it will do this better if
 “ good smelling woods are burnt, such as cyprus,
 “ juniper, pitch tree, &c. But Acron a physi-
 “ cian at Athens, is said to have gained great fame
 “ in the time of a great pestilence, by ordering
 “ a fire to be kindled near such as lay ill; for it re-
 “ lieved a great many.” That the same was like-
 wise done by Hippocrates, is also recorded by
 Galen^d and Aëtius^e. Galen adds, that Hippo-
 crates did not order the fires to be made through-
 out the city with any simple kind of fuel, but that
 he likewise added Garlands and the most sweet-
 smelling flowers, with fragrant ointments, that the
 people might by this means breathe the air puri-
 fied. Since therefore the moisture of the air is
 often so pernicious, if joined with heat, (see N^o. 3.
 pre-

^c In fine libri de Iride & Osiride Tom. II. pag. 383. ^d De
 Theriaca ad Pison. Lib. I. cap. 16. Charter. Tom. XIII. pag.
 935. ^e Lib. V. cap. 94. pag. 91. versa.

preceding,) as it may be thus corrected, it is evident that a happy event may be expected from this method. Thus it was observed in the *Ephmera Britannica*, or English sweating-fever, that Blacksmiths and cooks were saved by their fires, and remained free from this pestilential disorder^f.

But if this virus floating in the air be moved along with it by the winds, it may be conveyed from one place to another. Thus we read * that Empedocles having shut up the opening betwixt the mountains through which the violent and unhealthy south-wind blew into the plain country, he by that means excluded the plague. *Et Varro, cum Corcyra esset exercitus ac classis, & omnes domus repletæ essent ægrotis ac funeribus, immisso fenestris novis aquilone, & obstructis pestilentibus, januaque permutata, cæteraque ejus generis diligentia, suos comites, ac familiam, incolumes reduxit.* “ And
 “ when Varro was at Corcyra with his fleet and
 “ army, finding all the houses full of sick and
 “ dead people, by letting in the north wind at new
 “ openings, and obstructing the pestilential air,
 “ with changing the gates, and other diligences of
 “ the like kind, he by that means brought back
 “ his family and attendants in safety.” We also
 read in Homer^h, that when Apollo was pacified
 and pleased to free the Grecian army from the
 plague, he sent a violent wind. For many obser-
 vations have taught us that noxious and poisonous
 bodies may lie in the air, which stagnates or con-
 tinues a long while in the same place; but that
 they may be so dissipated only by moving the air,

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either

^f Joh. Caji. Britanni de Ephem. Britan. p. 89. * Plu-
 tarch. de Curiositate in initio. Tom. II. pag. 515. C. & adver-
 sus Colotem circa finem. ibid. pag. 1126. B ^g Scrip-
 tores rei rusticæ Varro Lib. I. cap. 4. Tom. I. pag. 151.
^h Iliad. Lib. I. pag. 21.

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either by the winds or other causes, as to be no longer hurtful. Thus, after an eruption of the vulcano in mount Vesuvius, the atmosphere is observed to be infected to a certain height from the earth; and that this malignity continues a long time in the same place, killing all animals and even plants. But in the mean time, such places are not to be distinguished by any ill smell or other sensible quality, except that by attentively viewing, there appears to the eye a sort of undulation in the air, almost like that which is perceived in the air which surrounds burning coals; and the light of a candle placed in this air, is soon extinguished. The only remedy is to dissipate these exhalations by moving the air either by wind, or the firing of cannon¹. The same thing has been also frequently observed in the digging of deep wells, so that workmen are now become cautious, and by letting down a candle first, they try whether any malignant damp lies concealed; and if the candle is extinguished, they dissipate and discharge the confined damp or poisonous effluvia, by throwing down a granade, or something of the like kind, and afterwards they descend with safety.

But besides these two ways of correcting the air, namely, by fires, and the violent motion of it by winds, others have endeavoured to correct and destroy the activity of the latent poison by diffusing certain vapours through the air. There may possibly be specific antidotes to these poisons subsisting in the stores of nature, though they are as yet unknown, because this poison in the air does not discover itself by any sensible qualities, but appears almost only by its effects. But in the mean time, it seems certain that this unknown matter in the air, disposes all the humours to a very bad and
sud-

¹ De Castera Histoire du Mont. Vesuve. pag. 296, &c.

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sudden putrefaction. In the dreadful plague of Athens which Thucydides has described, the breath of the patients immediately stunk intolerably in the very beginning of the disease. And we read in Hippocrates^k that in the frightful erysipelas which spread epidemically after the moist south wind, all the soft parts were so dissolved with a true putrefaction, that the whole thigh, leg, and foot, were laid naked. In the camp-dysenteries, the fœces smelled cadaverous, &c. and therefore remedies have in these cases been fetched in all ages from such things as the most effectually resist putrefaction, partly with a view to correct this putrefying and fluctuating poison in the air, and partly to arm and secure the human bodies against it, by rendering them the most averse to all putrefaction. Therefore some have recommended the agreeable exhalations of spices, but more especially acid vapours, which are certainly the most averse of any thing to putrefaction.

Therefore vinegar exposed to the fire in broad vessels or plates, and resolved into vapours, is a capital remedy in this case. Nitre or sea-salt sprinkled upon burning coals, are resolved into very moveable acid vapours, which never cease moving if they are pure, as we are taught by chemistry. Thus therefore the most effectual correctors of all putrefaction, will be every way diffused. But sulphur or brimstone above all other things, has been recommended for this use from the earliest antiquity with the greatest advantage. It is not without reason, that some physicians of the greatest note, have wondered that such extraordinary virtues should lie concealed in this soft and insipid body; for the very worst poisons lose their force only by melting with sulphur. White arsenic, than which
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* Epidem. 3. Charter. Tom. IX. pag. 265.

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there is hardly a stronger poison, being melted with an equal quantity of sulphur over a gentle fire, becomes so much weakened, that it may be taken to the quantity of a whole dram by a dog without damage. The regulus of antimony, a few grains of which will often purge the strongest man both upwards and downwards with the greatest violence and anxiety, being fused with an equal quantity of sulphur, is rendered unactive: crude mercury ground with sulphur by a long continued trituration, or intimately united with the sulphur, by melting over the fire, loses the great activity which it before possessed¹. The fumes of burning sulphur stop and prevent the most violent fermentation, and most powerfully resist all manner of putrefaction. When Achilles took out the drinking cup which was allowed to be used by none but Jove, he first depurated it^m with sulphur before he used it, because it was known that air long confined often contains something of malignity. And when the habitation of Ulysses continued in blood and slaughter from the killing of his nobles, before he would change his cloaths, he purified the house with the fumes of burning sulphur, and called it the cure of evils.

Οἷσε θείον γένυ κακῶν ἄκος οἷσε δὲ μοι πῦρ
 Ὀφρα θειώσω μέγαρονⁿ.

But the vapours of burning sulphur have this inconvenience, that being imprudently drawn into the lungs, it may suffocate, and thus it can destroy almost all kinds of animals. But when sulphur is mixed with nitre, it very readily turns into

¹ Freder. Hofmanni Observ. Phisico-chem. pag. 277, 278.
^m Homer. Lib. XVI. Illiad. pag. 297. ⁿ Homer. Odyss.
 in fine Lib. XXII. pag. 318.

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into flame, and does not yield such suffocating fumes; whence it is evident that gun-powder happily answers this intention: for this being made, as it is well known, of nitre, sulphur and charcoal, very readily takes fire, and the fumes hence made speedily diffuse themselves throughout the air, nor does the vapour thereof suffocate, but is rather of an agreeable smell. Helmont testifies^o, *Quod viderit, in Cataracta Gandavensi integram legionem Neapolitanam peste periisse. Erat autem ibidem co-hors Germanorum, quæ pulvere pyrio sua tinxerat indusia, ut lotrices, simulque pediculos excusarent. Horum si qui perirent, id præ dysenteria, non autem peste.* “ That he saw a whole legion of the Neapolitan army perish of the plague in the cata-
“ ract of Ghent. But there was at the same time
“ a regiment of German soldiers who had fumi-
“ gated their cloaths with gun-powder to dry
“ them, and to drive out the lice. But if any of
“ these last perished, it was with a dysentery, and
“ not with the pestilence.” This effect is there-
fore to be much more expected from the gun pow-
der, when it also moves the air powerfully by the
force of an explosion; and at the same time the
flame dispersing itself at large, dries and purifies it as
well as puts it in motion, and by replenishing the
same with acid vapours, it becomes the most averse
to all putrefaction.

5. When the irritation arises from passions of the mind, those passions are to be quieted by reasoning, by passions of a contrary nature, by a variety of objects, anodines, and opiates.

See

^o Tumulus Pestis in Capitulo, Hippocrates redivivus pag. 328.

See what has been said in the commentary to § 104, concerning the most efficacious remedies, whereby the passions of the mind may be either quieted or lessened, when they are the cause of too quick a circulation. It is evident from what Sanctorius.^p has said, concerning the passions of the mind, what great alterations are capable of being made by them in the most healthy body; and he very well observes^q, *Passiones animi non medicinis, sed alia passione contraria superari. Ira enim & spes auferunt timorem, & letitia mœstitiā.* “That
 “passions of the mind are to be cured not by medicines but by contrary passions; for anger and
 “hope remove fear, as joy dispels sorrow.” But passions of the mind are injurious, not only inasmuch as a fever may arise from thence without any other cause, but also as they dispose the body to be more easily affected by the other causes of diseases. Diemerbroek observes in his observations on the plague, that those who were most afraid, were soonest taken with it. And in his account of his own way of living, by confiding in which he boldly visited those who lay ill of the disease, he affirms, that himself remained free, and that he carefully avoided all passions of mind as much as possible, so that he lived free and without fear in the midst of a thousand who died. But if at any time he became sorrowful, which was hardly to be avoided in so desperate a calamity, he washed away his cares with wine till his spirits were revived, since nothing good could be expected from grieving at the common calamity.^r

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^p Ab Aphorismo 456. ad finem usque. ^q Aphorism. 467.
^r Diembroek de Peste, Lib. II. cap. 12. pag. 147.

6. That which arises from acid acrid food is to be remedied by diluting, obtunding, absorbing, or changing it into a neutral salt by watery liquors, jellies of animals, oily medicines, powder of chalk or oyster-shells, animal stones, fat earths, fixed and volatile alkaline salts, either alone or compounded with other things, (see what has been said before § 60, to 69.)

Acid acrid foods are those which are so either before they are taken into the body, or such as being mild and sweet when they are first taken in, do afterwards spontaneously degenerate into this kind of acrimony from too great a weakness of the changing powers. But from these acrids may arise fevers, whether they were taken in under the denomination of food, drink, sauces, medicines, or poisons (as we said before in the comment to § 586. N^o. 1.) But the cure of this acrid is effected

By diluting.] Which can be only obtained by water, or by such things as have water predominating. But how much good may be expected in weakening the strongest acid acrimony by diluting only, we are taught in a remarkable instance by Sydenham^s. “ An unfortunate man, melancholy with love, had taken a large quantity of corrosive sublimate; and when this most sharp poison had lain almost a whole hour in his body, with his mouth and lips very much swelled, and most excruciating pain at the stomach, Sydenham being called, immediately ordered a large quantity of warm water to be taken and
“ re-

^s Epistola I. responfor. pag. 404.

“ repeated again as soon as the first water was dis-
 “ charged out of the stomach ; and at the same
 “ time he ordered a large quantity of warm water
 “ to be injected by way of clyster The patient
 “ now being desirous of life immediately obeyed,
 “ and drank a much larger quantity of water than
 “ his physician had ordered, and by that means
 “ was in a few hours time freed from the most im-
 “ minent danger of death, only the swelling of his
 “ lips did not immediately subside, and his mouth
 “ continued sore and ulcerated ; which maladies
 “ however went off in four days time, only with
 “ the use of a milk-diet.” Hence it is evident
 how useful diluents only may be in diluting acrimony. But when what was taken into the body degenerates into an acid acrimony from too great a weakness of the stomach and intestines, diluents are then hurtful, inasmuch as they lessen the strength of these parts already weakened, (as was said before in the comment to § 66.)

Obrunding, absorbing, &c.] When we treated of diseases arising from a spontaneous acid humour, (§ 60 to 69.) we explained the various ways whereby an acid might be rendered unactive, or else changed into another nature. For the first is performed either by enveloping the acrid particles with oily substances, or by so arming the parts that acids cannot act upon them, Acids are attracted by all earthly absorbents, and uniting together with them, or with alkaline volatile or fixed salts, the acids are changed into a salt called neutral or compound, as being formed both of acid and alkali joined together : and these neutral salts are always mild, even though formed of the strongest acid and alkali, as we see evidently in vitriolated tartar. The gelatinous parts of animals are recommended for this purpose, such as, for example, jelly of hartshorn, ivory and flesh-broths boiled
 to

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to a trembling consistence, partly because they defend and envelope the acrid parts by their mild glutinosity, and partly because they naturally incline to an alcali: thus also oily substances are serviceable by enveloping, together with fat earths, such as the boles, sealed earths, &c. which allay all acrimony by their mild unctuosity. Yet these earths neither absorb nor change the acid, for as far as I have been able to observe, they do not effervesce with acids; but even chymical experiments rather teach that an acid itself lies concealed in these earths (see § 88. N^o. 5.) Concerning all the other correctors of acids we before treated, and determined the dose and method wherein they ought to be given to act with safety and efficacy, But more especially all these are useful in the tender age of infants, or in very weak people living on acrescent foods, in which fevers often arise from an acid acrimony; but the other kinds of fevers seldom owe their origin to this cause.

7. That irritation arising from acrid saline foods is to be remedied by diluting the acrimony with watery drinks, and by evacuating the same, and also by sheathing thereof by viscid and oily substances, and by correcting with lixivious medicines from quick-lime.

Sea-salt, and in some places sal-gem, which is very like unto sea-salt, is customary to be mixed with the food, to give it an agreeable relish, and frequently to prevent any corruption; for it is well known that flesh and fish, bread and many other kinds of food are preserved with salt. But sea-salt has this property, that when it has entered the
1 blood,

blood, and circulates together with it through the vessels, it is hardly at all changed by the powers of the body, but is discharged unaltered in the urine; and therefore in the urine of animals using sea-salt, after all the more volatile parts have been expelled by forcible fire, the sea-salt continues in the remaining *foeces* [†]. From whence it is evident that a more plentiful use of the sea-salt makes a stimulus which the powers of the body are not able to conquer, nor yet to alter, and therefore it is no wonder fevers should be thence excited. It is indeed seldom that so great a quantity of sea-salt is taken at once, as to be able to excite a violent fever by its stimulus; but those who delight too much in salted meats, or who are obliged to live upon them from the scarcity of fresh provisions, as often happens aboard a ship, from that cause they sometimes fall into the scurvy called *muriatic*, and the worst fevers sometimes arise from thence, when the quantity of salt daily taken in is neither subdued by the powers of the body, nor entirely expelled, but continues in the blood, and insinuating itself into the oily and earthy parts of the blood, adheres very obstinately, and therefore irritates life by a constant stimulus which is not easily to be effaced. For sea-salt may be embodied in fat substances, as appears in bacon and other fat salted meats, so that it cannot be extracted but by a long maceration and with the greatest difficulty.

The principal remedy for fevers arising from this cause is diluting with watery drinks, which nature calls for of her own accord; for if any one eats too much salt, intense thirst arising soon after obliges him to drink plentifully, whereby the salt is washed out from the blood, and commodiously expelled by the urinary passages. But as sailors in
long

[†] H. Boerhaave, Chem. Tom. II. pag. 313, & 326.

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long voyages are obliged to live entirely upon salt-meats, and have often either a scarcity of water, or such a corruption as renders it disagreeable, therefore too great a quantity of sea-salt continues mixed with the blood, and will be afterwards very difficult to be washed out. Since therefore in this case there is a muriatic acrimony in the humours which often occasions the very worst pains, it will be useful to mix oily substances with diluents, inasmuch as they sheath and mitigate all acrimony.

But when sea-salt is so intimately mixed with the oily and earthy parts of the blood that it cannot be washed out, the best remedy then to be had is a lixivium of quick-lime made by pouring six or eight times as much water upon it, more especially the quick-lime made of Leyden stone, and afterwards to clarify the decanted liquor by filtration. How much quick-lime is able to effect towards the purification of salts which are rendered foul with oils, the chemists well know, who depurate the volatile alkaline salts prepared from the parts of animals from their foetid oil, by subliming them from quick-lime, nor can they be rendered purer by any artifice. But it is also well known that quicklime being thrown into recent urine, immediately causes it to exhale a saline vapour which pierces the nose like a flash of fire, and which being collected by a slow distillation in close vessels, forms a very sharp and volatile liquor, of an intolerable fiery smell^u, and therefore the use of lixivium of quick-lime is very justly suspected; for if it produces the like fiery and volatile spirits in the body, the tender threads of the encephalon and nerves are destroyed. We read that the oxen which by accident drank a very strong lixivium of quick-lime, died some time after^w. But experience teaches us that the use of

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lixivi-

^u Idem ibidem, pag. 315.

^w Academ. des Sciences, l'An. 1700. Mem. pag. 158.

lixivium or quick-lime is not so fatal if it is prudently administered. The incomparable physician Burlet *, who administered this lixivium frequently and in various diseases, testifies that it did not always answer the great encomiums given of it; but in the mean time he did not observe any ill effects to come from it: and he observes that the exhibition of it was less useful in the same diseases in France than in Holland. But it was customary with him to give nine ounces of this strong lime-water in a day to young and robust patients mixed with an equal quantity of milk, ordering the patient to take a third part of the whole every four hours; but he affirms that the daily use of this medicine was serviceable in dysenteries and asthma's, continued in dysenteries for eight days, and in asthma's for a month. He had recourse to this medicine in many other diseases, but only learnt from them that its use was not so dangerous; but sometimes they who used this lixivium or lime-water lost their appetite entirely, and complained of a troublesome weight pressing at the stomach, from whence they were obliged to intermit the use of it for some days. I remember myself to have sometimes given the same quantity of lime-water without any damage thence following. But in the mean time the use of this medicine ought to be suspected in men of a warm habit, or afflicted with inflammatory diseases, or if certain signs appear of putrefaction; but in phlegmatic, cold and acid indispositions, it may be of great service, and is more especially recommended for extricating the more fixed muriatic salts mixed with the blood †. But when this lixivium or lime-water is administered, the patient's urine ought to be daily examined, to see

* Ibid. pag. 167, 168.

† H. Boerh. Chem. Tom. II. pag. 316.

see if any signs of putrefaction can be found in it; for, since the more acrid salts are washed out from the blood in the urine, it will best appear therein whether any alteration is made in the salts of the blood by the lime-water. But if such an appearance is found, the patient should abstain from any further use of it.

8. The irritation arising from acrid, aromatic and heating foods is to be remedied by diluting with watery drinks, by correcting with acids, by dissolving and cleansing with saponaceous acids, and by sheathing or mitigating with soft gelatinous substances. Hitherto belong also what relates to alcalescent acrids, and hence the cure of them likewise is intelligible.

They who make hunger their best sauce to food, seldom have a fever from this cause; but those who have a weak stomach, from gluttony and drinking, require these incentives to give them an appetite to eat: and therefore, there is such a great variety of sauces provided among the rich, and containing most of them the very sharpest spices. But now as all these are very useful in languid and cold diseases, by increasing the motion of the humours and warmth of the body, so on the contrary in healthy people, and especially those of a warm temperament, the most acute fevers often arise from the abuse of them. It is well known from chemistry, that the most agreeable spiciness of cinnamon, which is concentrated in its distilled oil, burns the tongue and excites a true inflammation. The same is also true of cloves and most

other spices, though in a less degree. No wonder therefore if fevers arise from an imprudent use of spices. But the remedy for fevers about to arise from this cause, will be in every thing capable of removing or weakening these stimuli. But this is done

By diluting with watery drinks.] For if that very sharp oil of cinnamon, which like actual fire burns the tongue, be ground with sugar, and mixed with water, it may be at pleasure so diluted as to become at length inactive. For water has this property, that it enervates every thing acrid capable of being dissolved in it, while the acrimony is equally distributed throughout its whole mass; and by thus dispersing them it occasions little or no action to be exerted by such things which having been concentrated together powerfully stimulate. Therefore every one who has taken a large quantity of such substances grows thirsty, nature pointing out the way whereby the disorder may be most commodiously conquered. Hence also great drinkers are delighted with spices, because making them thirsty they may be able to drink with more pleasure.

By correcting with acids.] For the agreeable coolness which acids introduce throughout the body, lessens the heat arising from spices, and at the same time corrects or lessens the aromatic acrimony itself. The pods of the most burning pepper of Brasil called capsicum, being infused in vinegar become mild, and the most sharp mustard-seeds being ground with vinegar become palatable, and the same is true almost of all other spices. Hence the juice of citrons, oranges, vinegar and the like, given with diluents are of the greatest use.

By

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By dissolving and cleansing with saponaceous acids.] In most spices that acrimony which is in its own nature very volatile is wrapped up in a tenacious oil, and by that means adheres very firmly to the parts of bodies, so as not to be easily washed out by watery liquors only. The cure of such an acrimony therefore requires a division of the oily tenacity in which the irritating acid is lodged, which can be well obtained by nothing so much as by saponaceous substances, especially such as are either acid, or inclining to be so for the reasons last mentioned. For it is scarce credible how obstinately that aromatic acrimony adheres, so that it cannot be washed or diluted out by any thing watery, more especially in spices that have this acrimony wrapped up in a more fixed oil. The fragrantcy of cinnamon, for example, flies off in vapours of boiling water, if they are not confined in close vessels; and even the oil of cinnamon being shook a long time together with water, loses its strength: but it is otherwise in pepper, from whence is drawn an oil by distillation, which smells with the fragrantcy of pepper, but affords no acrimony to the taste. The remaining decoction is indeed acrid enough, and yet the grains of pepper themselves retain so hot a taste, that they do not seem to have lost any thing; nor have I been able to wash out this acrimony of the pepper, even though the boiling be continued a long while, and repeated to the eighth time, and in a very large quantity of water, although they seemed to be reduced to the softness of a pulp by so many boilings. It is therefore evident enough that such an acrimony of many spices cannot be removed by diluents only. The saponaceous juices of ripe garden fruits being possessed of such a dissolving power, are in this case more especially useful. It is well known that the expressed juice of ripe

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grapes drank plentifully, dissolves all the humours, and often excites such a diarrhæa as almost exhausts the body, and reduces a fat person to a state of leanness in a few days time, almost all the fat being dissolved and expelled by stool. Honey, sugar, syrups, and inspissated juices prepared from such garden fruits are also most efficacious remedies in this case. I said before upon another occasion (see § 376.) that unwarily tasting the berries of Mezerean, which deceived my palate with a mild flavour, they left so great a burning in my fauces as made me afraid of suffocation; and it was in vain that I attempted to wash out that acrimony which resided in the oil; nor could I remove this troublesome acrimony by any thing but a mixture of vinegar and water with honey. A decoction of oats with simple oxymel, or with the inspissated juice of elderberries, currants, syrup of citron juice, &c. afford the most pleasant, and at the same time the best remedies. For in these there is a diluent water combined with a saponaceous deterging force and a pleasant acid; and at the same time the soft gluey substance of the oats serves to sheathe all acrimony.

By sheathing or mitigating with soft gelatinous substances.] Which are either procured from animals or vegetables: the first spontaneously incline to an alkaline nature, and the latter rather incline to an opposite disposition. When therefore a putrefaction of the humours is feared from too great motion, or the known temperature of the patient, we are to abstain from the use of jelly of harts-horn, ivory and the like, or at least we ought to add to them the juice of citrons, lemons, or the like, which may correct their insipid taste, and at the same time well resist putrefaction. Decoctions made of barley, oats, and the like, are useful by their

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their soft mealy glue, and are spontaneously inclined to acidity, which is here the best. Linseeds, the seeds of quinces, fleabane, &c. afford a soft glue or mucilage, which yet is tenacious and viscid enough to obstruct and load the stomach and first passages, if it is taken in too great a quantity. But a prudent use of these substances effectually infringes all acrimony, and very well arms the fauces, œsophagus and stomach, when they are almost excoriated by the sharpest spices.

Alcalescent acrids, &c.] Radishes, cresses, garlic, leeks, onions, &c. have a great acrimony, and at the same time incline to an alkaline nature, and many of them too contain a true volatile alkaline and oily salt. But for all these, diluting with watery drinks and correcting with acids, are equally useful with such things as sheath or obtund. But the saponaceous resolving medicines before recommended are not here so useful, because these acrids are not enveloped in such a tenacious oil, while the blood and all the humours are already too much dissolved by excess of the like alcalescent foods; for they who indulge themselves too much in these are often observed to be seized with profuse hæmorrhages. Therefore in this case austere acids are of the greatest use, as the fossil acid spirits of sea-salt, nitre, sulphur and vitriol; as also vegetable acids, which by strengthening the solids and compacting the fluids, are able to correct the pernicious effects of alcalescent acrids, such as unripe medlars, sumach-berries, roots of tormentil, bistort, &c.

9. That irritation which arises from alcalescent foods of the parts of animals, is to

be remedied by the means before described (§ 76, to 91.)

When we treated of diseases arising from a spontaneous alcali in the place here cited, it appeared that our body is of such a nature, that it is able to prepare such humours by the force of the vessels and viscera, with the commixture of the other animal humours, that although they proceeded from foods either inclined to acidity or already acid, yet the humours thus made never spontaneously turn acid, but incline to putrefaction. If therefore such nourishment is taken into the body as hath already this property, namely, which inclines to putrefaction, it is sufficiently evident that the spontaneous alteration of the ingested aliments conspiring together with the change to be introduced in them by the powers of the body, may give reason to fear a putrefaction, with all the maladies that may thence follow, unless acids or salts are taken in together with them, which powerfully resist all putrefaction. Hence no one can long support a diet prepared only of rapacious animals living upon other animals, and more especially if the flesh of such animals is prepared by baking, frying, or roasting. But what maladies may follow from such a diet, and what methods of cure are then required, we have already declared under the head of a spontaneous alcali.

10. That which arises from aliments offending in quantity, by constringing the mouths of the stomach, is remedied by diluting, fasting, vomiting and purging.

For the stomach to make a due digestion of the food, it is not to be filled beyond its proper strength, as we said more at large in the comment to § 586.

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Nº. 1. For that the quantity of the food only may be offensive, however salutary it may be in itself, we are taught by ravenous children, who frequently have fevers of the worst kind from this cause, until the load of offending matter is discharged from the stomach. For the food being taken in too large a quantity into the stomach, does not receive the change which is necessary that it might be further elaborated and perfected in the intestines, but it follows its spontaneous inclination, which tends either to an acid, putrid or rancid state. The whole cure therefore in this case will consist in discharging the offending quantity of aliment in the stomach; or if this cannot be safely performed, to allow some time for fasting, that the stomach may by degrees be capable of digesting what it contains, at the same time diluting the food contained, so that it may more easily pass out through the pylorus. For it is well known from physiology that the thinnest part of the ingested aliments passes out first through the pylorus, but that the more gross are longer retained, 'till they are better adapted to make their escape by a farther dissolution from the humours and liquors taken into the stomach. But the disorder is much the more dangerous when the excess in quantity of food over-distends the stomach so much, that both its orifices are contracted with a convulsive force or spasm, while in the mean time the air swallowed together with the food, rarefies by the warmth of the parts, and the aliments themselves entering upon an intestine motion of fermentation or putrefaction are expanded into a greater bulk; for thus the severe anguish arising from the turgescence of the stomach is increased every moment, the adjacent viscera are compressed, and the vessels dispersed through the substance of the stomach itself

self are straitened, whence an inflammation and even a gangrene itself of the stomach and viscera may arise from such a suffocation. In the mean time the descending trunk of the aorta, and the adjacent viscera, being compressed by the distended stomach, the blood is sent more difficultly through them; and therefore it is urged with a greater force towards the head, whence a redness of the face, watering of the eyes, head-ach, giddiness, and sometimes a fatal apoplexy may with reason be feared. But that an over-distension of the stomach will so close up its orifices that nothing can pass out, appears from many observations. When great drinkers at a feast take down large draughts at once, each orifice of the stomach is then constricted with a spasm or cramp from the coldness or quantity of the wine, and soon after follows intolerable anxiety; and even though they press the abdomen with their hands, nothing can be forced out of the stomach to give them any ease. How doubtful and dangerous the case then is, readily appears; for if you attempt to unload the stomach by vomit, in the act thereof the distended stomach is violently compressed betwixt the abdominal muscles and diaphragm as in a press, and if at the same time the upper orifice is not relaxed, the stomach may burst; or else the blood being violently drove towards the head in the endeavour to vomit, there may be danger of a fatal apoplexy from a rupture in the vessels of the encephalon. It is therefore more adviseable first to empty the vessels by plentiful bleeding, and then to excite vomiting by irritating the fauces with a feather. Then also such vomits will be serviceable as act immediately without any delay, as the vitriolum album diluted with water, which excites a vomiting almost as soon as it is swallowed,

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for here delay is dangerous. But when the stomach is overcharged with too great a quantity of food, and yet is not so distended as to cause a close contraction of both the orifices, then there is opportunity for diluting, and only warm water of itself is almost sufficient for the intention, because it at the same time usually excites a sickness and inclination to vomit, more especially if it was sweetened with honey. But if no vomit follows after diluting, nor any relief to the anguish, it denotes that the contents of the stomach are partly escaped through the pylorus: other vomits may then take place, which usually operate in some time after they are given, of which there are several forms given in the *Materia Medica* corresponding to this number of the present aphorism; and it will be also useful to give a purge afterwards, that the crude matter which has passed from the stomach into the intestines may be expelled out of the body, and not be offensive for the future. For every thing which has not been changed by the action of the stomach, will be more difficult to digest into good chyle, when it comes into the intestines.

But how dangerous it is to excite violent vomiting when the stomach is full, is sufficiently evident from the unhappy case of the late most noble Lord High Admiral of our Republic (see the comment to § 170. N°. 5.) who by the strongest endeavours broke off the tube of the œsophagus of the stomach near the diaphragm, from whence he unhappily perished after the most intolerable tortures.

But when the stomach has been a long time distended with too great a quantity of food, it often loses its strength, and remains as it were paralytic for some time after it has been emptied of its contents;

contents; and this for the reasons before given in the comment to § 25. N^o. 3. nor are the muscular fibres constituting the substance of the stomach alone weakened, but its orifices are also relaxed; so that the ingested aliments are lodged as it were in a loose sack, exerting no action upon them, and in a little time they pass by the motion of respiration through the pylorus into the intestines, having suffered little or no change in the stomach. The same thing we see happens when the bladder becomes paralytic after retaining the urine a long time, and when it has been drawn out by the catheter; for then a most troublesome incontinency or dripping of the urine often continues for a long time, while the sphincter of the bladder being also relaxed, is not capable of contracting the neck. In this case the best remedy is to take food and drink in small quantities at a time, to avoid all distension of the stomach; for thus the too much distracted fibres gradually recover their former strength (see the comment to § 28. N^o 5.).

- II. That which arises from acrid fermented drinks, or from a fermenting acid, oily, or aromatic stimulus introduced by distillation, or spontaneously; such acrimony is removed by the remedies before mentioned (N^o 5, 6, 8, of this aphorism).

That the worst fevers may arise from hence, we have already seen in the comment to § 586. N^o. 1. for by fermentation we know there is a wonderful kind of new stimulus formed even in such things as before had no apparent acrimony. Thus the juice of grapes, which is so mild and sweet at its first expression, is by fermentation only changed
into

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into a very fragrant wine; and from the very soft meal of barley by fermentation may be made the strongest alcohol. But during the time while these are fermenting, a most fragrant vapour is discharged, which is wonderfully refreshing if drawn sparingly thro' the nostrils; but at the same time it is a most certain poison, if it is imprudently breathed in too copiously, especially if the vapour from the cask of fermenting wine comes thro' only a small vent-hole. From this cause we read of a fatal apoplexy^z arising in a man, who went into a cellar wherein was collected a large quantity of this wild spirit, which in the height of the fermentation had flown off with great violence from the fermenting liquors. But although there may be something of this spirit remaining in alcohol made from fermented liquors, yet it seems to be distinct from the alcohol itself. Helmont calls this spirit *Gas*^a, and confesses; *Se olim auctoritate scriptorum delusum credidisse, Gas uvarum esse spiritum vini in musto: sed cassa tentamina docuerunt, esse Gas uvarum & musti, in via ad vinum, non autem vini spiritum.* "That being deluded by the
 " authority of writers, he believed that the gas
 " of grapes was the spirit of wine in the must;
 " but unsuccessful experiments have taught us
 " that the gas of grapes and wine is a sort of in-
 " termediate agent in the way of its being form-
 " ed into wine, and not spirit of wine itself."
 But since fermentation is performed in the open air, it would seem that this volatile spirit arising in fermented liquors must exhale for the most part; but perhaps also some part of it is retained
 by,

^z Herm. Boerh. Chem. Tom. I. pag. 806. Tom. II. pag. 180. Mis. curios. decur. 3. ann. 2. pag. 56. ^a In Capitulo: Complexionum atque mitionum elementalium figmentum N^o. 18. pag. 87.

by, and fixed in the rest of the fermented liquor. Certain it is, that if the purest tartar be distilled in close vessels, something escapes from it so volatile that it cannot be confined in any vessels; and if the vessels are so close as not to afford it any vent, however large the receiver may be, it will make itself a way through by causing the receiver to fly. Hence it appears how dangerous it must be to drink liquors which have had their fermentation suppressed in the act itself; for from thence the most violent cholera morbus and other dreadful maladies have often followed. Perhaps in new and brisk wines some of this spirit being confined, affords that which is so highly restorative to old age, and from whence Cornaro found his languishing powers in the last of his old age immediately recruited, when they could not be raised by any other remedy, as we said before upon another occasion in the comment to § 55.

But after the fermentation is over and the fæces deposited to the bottom, the limpid liquor swimming above is called wine, which though prepared of very different materials, and differing in the smell, taste, and other properties, yet it has this in common, that being drank in a large quantity it inebriates or fuddles, and gives by distillation an ardent spirit miscible with water; for whether the liquor be prepared from the juice of grapes, honey, barley, or any other fermentable substance, always the same spirit is obtained.

When any fermented liquor, wine, mead, strong ale, or the like, is drank by a person not much accustomed to it, it induces a greater heat throughout the body with chearfulness of mind; all the senses become more ready and the members more active, all the passions of the mind are most quiet or agreeable, devouring cares are mollified,

fied, and the reason becomes most correct; and even a person who has been exhausted by meditation finds very great refreshment by a moderate use of wine; therefore under a just moderation fermented liquors may be put to the best uses. But if they are taken in a larger quantity, all the senses both internal and external, with the voluntary motions, are disturbed and weakened, inso-much that neither the hand, foot, tongue, nor even the mind can any longer perform their office; and at length from excess in the use of them, every thing proceeding from the mind is abolished, inso-much that people fall into a most deep sleep or stupidity, or even sometimes into a most fatal apoplexy, as we are assured from medical observations.

But inflammable spirits made from such fermented liquors produce all these effects much sooner; but then they likewise disappear sooner, as they are in a little time again exhaled from the body. Therefore the inebriating force in these liquors seems to proceed from the inflammable spirit which they contain; for if that be removed by distillation, or exhaled by neglecting to keep the liquor close, what remains is vapid and inert, having lost all its inebriating force.

But worse consequences arise from the drinking inflammable spirits than fermented liquors, because in the former there is observed a force of coagulating the blood and lymph, and of hardening the solid parts; and the more so, as being diluted with a less quantity of water, they approach nearer to the nature of alcohol. Hence those unhappy patients who have too much indulged themselves in these liquors, are frequently troubled with the most obstinate obstructions, and even sometimes their viscera are found perfectly scirrhus after death, as was said before upon another occasion in the comment to

§ 28. But the worst of all is when sharp spices are added to these burning spirits, especially such as afford a great quantity of oil; for then the strong aromatic force increases all these maladies, and may be able to excite the most ardent fevers. Thus for example, a greater or more lasting drunkenness arises from aniseed water or spirit, than from vinous spirit only drank in the same quantity.

But the cure of such maladies as follow from the use of fermented liquors is various. For one method is required during the time of the drunken fit, and another method of cure is required in the crapulary fever which follows after. Again, a different method of cure will be proper for those who seldom indulge themselves thus; and in those ^b, *Tanquam ad perdenda vina geniti, & tanquam effundi illa non possint, nisi per humanum corpus.*

“Who being formed as it were for the destruction of wines, cannot pour them out but through the body,” having their veins always filled with the wine of the day before; for there is a great deal of difference betwixt the curing of a person drunk, and one who is addicted to that practice. Moreover, a different method of cure will be required according to the different acrimony of fermented liquor, as it is either acrid, oily, aromatic, &c.

When therefore a fever is kindled from having taken too great a quantity of fermented liquors, the best method of all is to dilute with a great quantity of water or watery liquors of any kind, for thus the disorder will be allayed in a short time. For the strongest wines (as was said in the second number of this aphorism) being diluted with much water, may be safely given even to febrile patients; and even alcohol itself diluted with a large quantity of

^b Plinii Natur. Hist. Lib. XV. cap. 22. pag. 355.

of water may be safely drank." * *Ingeniosissimus sui sæculi medicus Cassius, febricitanti cuidam & magna siti affecto, cum post ebrietatem illum premi cepisse cognosceret, aquam frigidam ingessit. Qua ille epota, cum vini vim miscendo fregisset, protinus febrem somno & sudore discussit.* "The most ingenious physician of his age Cassius, gave cold water to one ill of a fever attended with great thirst, when he had learnt that the patient began to be taken with it after a fit of drunkenness, and which water being drank by the patient, destroyed the force of the wine by mixing with it, and immediately carried off the fever by sleep and sweating." But it is better to give such watery drinks tepid, lest by the sudden cold of them they should injure the heated body. These are also serviceable, because they often occasion a great part of the fermented liquor to be thrown up by vomit. This being done, quiet sleep is the best remedy, that by this means the fibres may rest. The like method has been recommended by Hippocrates; for if a person has lost his speech from a drunken fit, he then orders the patient, *Multa calida lavari, & spongiæ calidæ imbutas ad caput admoveri, donec ad se redeat; deinde copioso oleo illitum, in mollioribus stratis, vestimentis lectum recumbere; neque apud eum lucernam ardere, neque loqui. A balneo enim ut plurimum dormit; & si dormierit, sanus evadit*;^c "To be washed with much warm water, and sponges dipped in warm water to be applied to the head 'till the patient comes to himself; and then after plentifully anointing with oil to let him lie in his cloaths lightly covered over, and not to speak to him, nor burn any light near him. For after bathing, sleep generally follows,

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* Celsus in Præfatione pag. 18. ^c Hippocrat. de Morbis Lib. I. cap. 7. Charter. Tom. VII. p. 559.

“ and if the patient sleeps he recovers his health “ and senses.” Yet watchfulness and a crapulary fever as it is called, will remain the same day as a punishment, together with a weariness of the whole body, pain in the head, sickness in the stomach, and often a giddiness. In this case a gentle vomit is usually of service to discharge the humours loading the stomach, and this being done nothing can be more useful than strong wine in moderation, by the grateful stimulus of which the languishing powers of the body may be raised. Even Hippocrates^d says; *Si ex crapula caput doleat, vini meraci beminam bibat.* “ That if the head “ aches from a crapula, let the patient drink three “ gills of strong wine.” Hence those who contend daily with Bacchus having once experienced this, often indulge themselves the next morning with fermented spirits, till at last by a repeated abuse of them they unhappily destroy the body. But when the fermented liquor drank is also impregnated either with an acid, oily or aromatic acrimony, then it will be also necessary to have recourse to the medicines enumerated at the sixth and eighth number of the present aphorism.

But miserable is the condition of those who daily indulge themselves in these liquors, for a fatal necessity then follows of repeating them; and at length almost the whole system of their vital and animal actions depends upon a repetition of their drinking, *Pallor enim, genæ pendulæ, & tremulæ manus effundentes plena vasa*^e. “ For paleness and “ sinking in, or looseness of their cheeks, with “ trembling hands beset with large blood-vessels,” oblige them to drink again even without invitation.

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^d Epidem. Lib. II. in fine. Charter. Tom. IX. p. 192.

^e Plinii Natur. Hist. Lib. XV. cap. 22. pag. 355.

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I have with great pity seen a young man, who being about to get out of bed in a morning trembled, and had very troublesome palpitations of the heart, being hardly able to move any limb, much less put on his cloaths, until he had taken a few ounces of brandy. If this unhappy person attempted at any time from great necessity to oppose this custom, he fell into faintings, and was obliged to use it even against his will. Thus at length his limbs being contracted with great driness he miserably perished in the flower of his age, after leading a most calamitous life.

Drunken people therefore are never able to abstain from these liquors altogether at once, nor would it be safe for them if they could. For if the advice of Hippocrates †, that sudden changes are bad, ought to be observed in any case, it should in this; for as the same great man observes, those alterations only are safe which are made by degrees, more especially if a person leaves one custom to take to another of an opposite kind. For by taking large quantities of fermented liquors or inflammable spirits thence distilled, the body is heated, the humours rarified, and the vessels are swelled by their distension with the rarefied humours; but so soon as the force of these liquors has vanished, the body is left weak, cold and enervated, until this languor is removed by the same kind of stimuli. They are also usually tormented with severe thirst afterwards, and thus by much drinking they increase the weakness which is once formed. But when drunkards daily indulge themselves in these liquors, the vessels which are so often dilated become weak, and lose their tone or contractile force, giving way too

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easily

† Aphor. 50, & 51. Sect. II. Charter. Tom. IX. pag. 88, 89.

easily to the distending humours. Hence follows a less action of the vessels upon the humours, and so a less perfect assimilation of the ingested aliments must consequently ensue; whence an ill habit both of the solids and fluids, and at length a fatal dropy is usually the result in such people: All which bad accidents are likewise hastened, if they are obliged to abstain from these drinks altogether at once. The best method of cure therefore will be to lessen by degrees the abuse of wine, or spirits drawn from fermented liquors; as instead of naked inflammable spirits, strong and rich wine may be drank in moderation, which may support the languishing powers and relieve the weakness of the stomach, while at the same time it is not attended with those ill consequences which are justly feared from ardent spirits, namely, a coagulation of the humours, and a too great hardness of the solid parts. In the mean time the diet should be dry, of bread well fermented, or which has been baked twice, the roasted flesh of young animals, boiled river fish, and strong ale for the common drink, avoiding warm watery liquors which weaken, and at the same time increasing by degrees the exercise of body; whereby the vessels and viscera may be strengthened. If the signs teach that the blood inclines to an inflammatory tenacity, acid saponaceous juices, such as the rob of elderberries, currants, oxymel, and the like, will be of service. But if these drinkers are in years and inclined to be dropical, the Theriaca Andromachi, Diatesaron, candied ginger, and the like warm aromatic medicines will be of the greatest use, as they excite an agreeable warmth in the stomach, dispose it for the better performance of its office, and recruit the lost or weakened powers of the body, so as to enable it to refrain from fermented liquors

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liquors without damage. This method has its effect in cases almost deplorable, nor does it ever deceive the expectation, unless when the viscera have acquired a schirrous disposition, or when the tender pulp of the encephalon and nerves being almost destroyed, has rendered these disorders already incurable.

12. That irritation which arises from too much watchfulness or want of sleep, is cured by the same means with those before proposed N^o. 1, 2, 5. of this aphorism.

So long as we are awake the organs of sense are affected by objects, and the muscular motions are performed; for a healthy person being perfectly at rest in body, and not affected by any external object, soon falls into a sleep. But to dispose the senses to be affected by objects, and for the motions of the muscles to be performed, requires the presence of good spirits plentifully supplied in the brain, its medulla, nerves, and in the muscles*. To be long watchful therefore consumes the spirits, dissipates the most subtle humours and dries up the rest, breeds melancholy or atra bilis in the body, settles in the hypochondria, and disturbs the functions of the brain: Hence follows delirium, ravings, madness, &c. But all the actions of the chylicative viscera are also made languid from the same cause, whence a cachexy, caco-chymy, and the other numerous maladies which thence proceed. For the subtle spirits which are consumed by vigilance can be repaired by no art but by sleep; for whoever watches all night, and has not been accustomed to interrupt their sleep,

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will

* H. Boerh. Instit. § 588.

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 will find all their limbs heavy the next day, the whole body weak, and almost every one of its functions disturbed; nor will these complaints cease 'till the languishing members are refreshed by sleep. Hence Hippocrates[†] observes, *Vehemens vigilia potus & cibos, tum crudos, tum incoctiores efficit.* "That vehement watchings occasion the food and drink to be both crude and indigested;" and in another place[‡], *Pessimum autem est non dormire, neque die, vel enim præ dolore aut afflictione vigilarit, aut delirabit ab hoc signo.* "But it is a very bad sign not to sleep either in the night, or in the day, for either the patient will become vigil through pain or affliction, or else will be delirious from this sign." In those who thro' the severity of their studies break thro' their rest in the nights, there are many sad instances demonstrating the pernicious effects of over watching; for either they fall into fevers of the worst kind, always accompanied with a delirium, or else they are taken with an obstinate madness.

The cure therefore of fevers arising from over watchings requires sleep in the patient, to correct those changes which happen to the body from too much vigilance. The first is performed, if all violent passions of the mind, which are frequently the cause of over watchfulness, are allayed by such remedies as those concerning which we treated at the fifth number of the present aphorism. At the same time the most profound rest and silence should be procured to the body by removing every thing capable of violently affecting the senses; and therefore such patients should be retained in a very dark place, the most remote from all noise.

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[†] De Visu acutor. Charter. Tom. XI. pag. 76. [‡] Coac. prænot. N°. 497. Charter. Tom. VIII. pag. 881. & in Prognosis ibid. pag. 625.

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Decoctions of the softest mealy substances, emulsions prepared from the same are likewise of the greatest use, adding at the same time the prudent use of anodynes, if sleep cannot be procured by the former remedies. But since by over watching, as well as by too much heat and motion of the air, the most fluid parts of the humours are dissipated, therefore moistening, diluent and nitrous medicines with honey, &c. will be serviceable, concerning which we treated at the first and second number of the present aphorism.

13. If the irritation proceeds from excrements retained in the body, from an alkaline, acid, oily, saponaceous or putrid acrimony, that acrimony is to be rendered fluid, the passages are to be lubricated, the emunctories opened; the expulsive powers are to be stimulated and increased, and all this is to be performed as well by external as internal remedies.

Those particles being retained in the body which used to be discharged, excite fevers, as we have already seen (§ 586. N^o. 2.) For by those actions which are required to life and health, some parts of the solids and fluids are so altered that they become unfit for those uses which they ought to serve agreeable to the laws of health; hence these parts ought to be expelled from the body, lest being retained too long they should acquire too great acrimony, and by that means injure health. These evacuations are commonly made by three capital emunctories, namely by stool, urine and perspiration. By stool those parts of the ingested aliments are evacuated, which remain indigested after having suffered the action of the stomach and intestines, accompanied with those

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fæces which have been left behind from the humours themselves flowing or distilling into the cavity of the stomach and intestines. By urine the oily and saline parts of the blood which are become too acrid are washed out. By perspiration also some parts are exhaled (together with a most thin water serving to moisten, and preserve the smallest vessels opening on the surface of the body) which being retained would be injurious, as we have often said before. The menstrual flux in women discharges what is superfluous, and by the lochial discharges of lying-in women that blood is expelled which lay in the dilated vessels of the uterus, and which being exposed to the air is very soon corrupted. But sometimes in fevers themselves the morbid matter is subdued and rendered moveable by the fever, yet retains such qualities as oppose the equable circulation, which makes an expulsion of it in this case necessary (see § 594. N^o 2.)

But all these parts being left in the body cannot be assimilated into healthy humours, whence they spontaneously degenerate by the heat of the body itself, and variously change, according to the different nature of things which are thus retained in the body. For in infants and weak people the fæces being too long retained in the intestines puts on an acrimony of the worst kind, more especially if they feed upon such aliments as spontaneously incline to acidity. But the other kinds of retained excrements rather incline to a putrid alkaline acrimony, or else to a rancid malignant corruption, when there are a great many oily or fat particles, or else likewise into saponaceous putrefaction, as generally happens, when the salts being rendered more acrid are united together with the oils. Thus there is observed a very bad putrefaction

putrefaction of the saponaceous bile in diseases, and salts and oils being intimately united together in the urine, form as it were a saponaceous lixivium frothing when it is shook, but often in some measure putrid in acute diseases. How foetid the lochia are often discharged, when they have been too long retained in lying-in women, is testified by daily observation; whence also the most putrid and suddenly fatal fevers often arise from the suppression of them.

Yet are not all excrements long retained equally pernicious. An entire suppression of the urine is indeed the worst, yet it is tolerable for several days, though it is never without danger. An obstructed perspiration is commonly followed immediately with a heaviness and weariness, &c. and if it continues any considerable time it commonly occasions a fever. A suppression of the intestinal fæces may be longest of all supported, and often without any great damage; and it is even customary with many strong and even healthy men, only to discharge their fæces once within three or four days. But in these the fæces are collected together near the rectum; and that part which might have offended by its putrefaction is commonly expelled by wind, while the rest are dried up and formed into the most hard fæces. Hence in diseases there is no such very urgent indication arising from a constipation of the bowels, unless there are signs denoting that corrupt humours stagnate in the first passages. At least in healthy people we are not immediately to have recourse to purges, upon finding the bowels more than usually constipated. Hippocrates^b indeed says; *In omnibus morbis ventres subluendos esse, aut glandes supponendas, si alvus non subducatur.* "That in all diseases the
" bowels

^b De Morbis Lib. II. cap. 21. Charter. Tom. VII. p. 573.

“ bowels are to be cleansed by clysters, and if they
 “ are not mindful of their office suppositories must
 be used.” But these act only by diluting the
 fæces and relaxing the intestines, or else by irritat-
 ing the end of the rectum, they excite a tenesmus or
 inclination to empty the bowels, and therefore they
 may be very safely used. But the fault of many
 lies in this, that in such cases they have imme-
 diately recourse to purges, whereby the body is
 often disturbed, and those evacuations suppressed
 by which nature endeavoured to cure the disease.
 Thus Sydenham ¹ observes, that in the cure of a
 continual fever which he describes, it always fared
 so much the better with the patient as the bowels
 were more constipated in the decline of the dis-
 ease after suitable evacuations had been premised.

When therefore any of the excrements being
 retained in the body have excited disease, they must
 be expelled. But that this may be performed, the
 matter to be discharged must be rendered fluid,
 that it may be able to pass through the passages
 whereby it ought to escape from the body. The
 passages themselves are therefore to be lubricated,
 that they may easily transmit what is to be expelled.
 If any of the emunctories are obstructed, they are
 to be first opened; and lastly, when all this is per-
 formed it is required to stimulate and increase those
 powers by which the excrements are naturally ex-
 pelled, that after being collected together by a
 long retention, they may be thrown out of the
 body by the increase of these powers. This thing
 will appear more evident by example: Some lean
 people of a tense fibre have such strong chylica-
 tive viscera, that they draw off every thing that is
 soluble from the ingested aliments, and therefore
 leave the fæces accumulated, dry and juiceless, in the
 large

¹ Sect. I. Cap. 4. pag. 70.

large intestines; and as in such dry habits there is found a less quantity of that lubricating mucus lining the large intestines, especially towards the extremity of them, therefore the exclusion of the dry fæces is rendered more difficult; hence such people are commonly costive, and frequently to a very great degree. The best remedy then in the power of art is to divide the too gross fæces by a plentiful use of saponaceous medicines with honey by the very emollient decoctions of marsh-mallows, common mallows, linseed, &c. to moisten and dilute the too dry parts; to anoint and lubricate the sides of the intestines by drinking of oil, or by the injection of clysters; or lastly, by fomenting the anus with warm baths or fomentations, that the parts being relaxed may give way more easily. But when all these means have been tried, then and not before it will be convenient to stimulate and increase the expulsive powers, whether it be attempted either by giving a purge, a sharp clyster, or lastly, by exciting a tenesmus to discharge the fæces by intruding a suppository into the anus. But if the expulsive forces are stimulated before the fæces are rendered fluid, the passages lubricated, and the emunctories opened, all the disorders will be increased, and the hard fæces being put into motion may excoriate and inflame the sides of the intestines, whence frequently ensue the very worst diseases. Hence Hippocrates^{*} justly pronounces; *Corpora, si quis purgare voluerit, meabilia* (εύροα) *facere oportet.* "That if any one intends to purge or cleanse the body, he ought first to render the excrements pervious." But from this example it is evident enough that the like methods must be prosecuted in a suppression of the other natural excrements.

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^{*} Aphor. 9. Sect. II. Charter. Tom. IX. pag. 49.

The same precaution must be likewise observed when the evacuation of morbid excrements is to be promoted: For it is first required to subdue the morbid matter, and render it moveable by the force of the fever itself, before any expulsion of it is designed. Hence again Hippocrates¹ gives us an admonition; *Concocta purganda sunt & movenda, non cruda, neque in initiis, nisi turgeant, plerumque autem non turgent.* “That such morbid humours are to be purged off and put into motion as are concocted, and not such as are crude; nor are we to work these effects in the beginning of diseases unless they overpower nature by their violence, which they generally do not.” What mischiefs follow when physicians neglect this rule in the cure of diseases, has been taught by Sydenham in several parts of his works; for many observing, that after continued fevers had gone regularly through their course, they often went off with a mild diaphoresis, therefore they endeavour to force sweats in the beginning of the disease; but this is commonly attended with fatal events, inasmuch as the fever being increased by heating medicines brings on a phrenzy, peripneumony, and the like most grievous maladies. But when the wise physician observed that the force of the disease languished on the twelfth day of an acute continual fever, the morbid matter being in the mean time concocted, and nature endeavouring to make a separation, then he would have the warmer medicines to be more freely used; and by this means the matter to be discharged being first rendered fluxile, he stimulated the expulsive powers, and with very good success^m. But as nature

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¹ Aphor. 22. Sect. I. Charter. Tom. IX. pag. 38.

^m Sydenham Sect. I. cap. 4. pag. 71.

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is used to endeavour to expel the concocted and morbid matter by various ways (see § 594. N^o. 2.) therefore one ought carefully to distinguish which way nature inclines; and when we have discovered those ways, we are to apply remedies of this kind both external and internal accordingly; for as Hippocrates says, *Quæ ducere oportet, ducenda sunt, quo maximè vergat natura, per loca conferentia*. "What
" ought to be evacuated must be drawn off by
" those ways which are most inclined to by nature,
" and by the most agreeable passages".

S E C T. DCVI.

THE emunctories are set open by resolving the impacted matter, and by relaxing the obstructed vessels; which are obtained by warm bathing, fomenting, frictions, shaving of the hair, and cleansing the skin (see § 107. to 144).

If the retention of the excrement to be expelled proceeds from an obstruction of the emunctory, it is very evident that this must be first opened: but this obstruction of the emunctory proceeds either from an imperviousness of the matter hesitating in the outlet, or by a compressure from the adjacent obstructed and distended vessels. In either case the impacted matter is to be resolved, or the obstructed vessel so relaxed that it may give way more easily to the force of the humours urging behind, and by that means dilating, transmit what adhered immovable. For as we said in the aphorism cited in the text (which contained the whole history and cure of obstruction) the vessels are obstructed through a defect
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" Hippocr. Aphor. 21. Sect. I. Charter. Tom. IX. pag. 38.

of the particles to be transmitted exceeding the capacity of the transmitting vessel; and therefore must follow either from a narrowness of the vessel, the bulk of the particles to be transmitted, or of both together. The effect will therefore be the same, namely, a resolution of the obstruction, whether the capacity of the vessel be increased, or the bulk of the particles to be transmitted, lessened, and more especially will the cure be sooner obtained, if both these effects are accomplished at once. But here a different method of cure is evidently required according to the different causes of obstruction, and the more or less obstinate cohesion of the impacted matter, concerning which we treated under the head of obstruction. But this intention may be more especially answered in these cases,

By warm bathing and fomenting.] How useful these means are to relax parts too rigid has been said in the comment to § 35. N°. 3. and at § 127. N°. 2. But these also at the same time apply a diluent vehicle to the parts to dissolve the impacted obstructing matter. But of all things the vaporous bath has the most happy effects, since the vapour of warm water much more powerfully relaxes every thing than the hot water itself. This is evident from the most compact hartshorns, which soon grow soft by a philosophical calcination, as it is called; namely, by exposing them to the vapour of boiling water, which softens them more effectually than a long continued boiling in the same water. Practical observations teach us, that a most stubborn suppression of urine from a fault in the kidneys has often been cured by warm bathing. But more especially a warm vaporous bath conduces very effectually to open the obstructed pores of the skin. It was said upon another occasion in the comment to § 529. N°. 2.

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in what manner warm vapours might be artificially applied to the body so as to excite a sweat at pleasure, and that in so great a quantity that the strongest man could not support those most profuse sweats for two hours without fainting and falling down in a deliquium. Hence it is evident of how great use this method may be when the whole skin is dry in acute fevers, and how unhappily then physicians urge forward the humours by warm sudorifics, while the emissories of the skin are obstructed. Hence Celsus * justly pronounces of warm bathing, *Fere adhiberi, ubi summam cutem relaxari, evocarique corruptum humorem, & habitum corporis mutari expedit.* "That they ought to be used where the skin requires to be highly relaxed, and to call out the corrupt humour and change the whole habit of body."

By frictions.] Of what efficacy friction is in the cure of obstructions was said in the comment to § 133. N°. 3. more especially if the vessels have been first relaxed, and the offending matter begun to be resolved by warm bathing and fomenting: for then the impervious particles are comminuted and divided by the alternate compression and relaxation, and by that means become fit to pass through the narrowest extremities of the vessels. But we know that the veins being compressed by frictions, accelerate the course of the venal blood towards the heart, which is therefore irritated into quicker contractions; so that by very violent frictions a burning fever may be raised in a cold person. Hence it appears that when frictions are used to febrile patients, care ought to be taken not to increase the motion of the

* Lib. II. cap. 17. pag. 93.

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the humours by that means which is often already too quick.

Hence Celsus^p justly advises, *Longa vero frictione uti, neque in acutis morbis, neque incrementibus convenit, præterquam quum phreneticis somnus ea quaeritur. Amat autem hoc auxilium valetudo longa, & jam a primo impetu inclinata.* “ That to use
“ long continued friction is neither convenient in
“ acute diseases nor in those slowly increasing,
“ more especially when sleep is desired thereby in
“ phrenetic patients. For this remedy agrees best
“ with long continued health inclining to take
“ place of the disease from its first attack.” But as it serves to open the emunctories in the end of diseases, that the concocted and moveable morbid matter may be more happily expelled, it may be therefore safely enough used in moderation.

By shaving off the hair and cleansing the skin.] The whole surface of the skin is covered over with an oily liniment, which prevents it from drying up too much by the air, and preserves it lax and moveable. If this liniment is collected and dried upon the surface of the skin, it will very apparently obstruct the free perspiration, insomuch that often stubborn cutaneous diseases arise from thence in filthy people. Cleanliness of the skin is therefore necessary to keep the emunctories of the skin free or pervious, and this will be easily obtained by warm bathing, washing, and then a gentle friction. But in the scalp, or that part of the head which is covered with hair, this liniment is most abundant, and seems easily to thicken, whence that fat scaly scurf often abounds in the heads of the most healthy people. If therefore it is required in some diseases to procure a very free perspiration through the skin of the head, shaving off the

^p Lib. II. cap. 14. pag. 89.

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the hair will be very serviceable to that end: and after that the naked skin may be very commodiously cleansed by gentle friction or wiping. In those fevers where the morbid matter usually tends to the head, and excites either a phrenzy or a coma, Sydenham^a observes that nothing is more useful than shaving of the head in such patients; and then without applying any plaster, to let the head be covered with a cap not too thick to keep off the external cold. For by this means there is a very free circulation of the humours procured through the external branches of the carotid arteries, which averts the impetus of the blood from the encephalon.

But all the means directed in this aphorism being performed, *Undique apertum corpus, & perspirans, & motum, quod conducat, faciet*; “Will
“ effect all that can be done to render the body
“ open and pervious throughout, promoting the
“ perspiration and free motion of the humours,
“ as Hippocrates says^r.”

S E C T. DCVII.

THAT which stagnates at the extremities of the arteries from too great a quantity of blood compressing the vessels, is restored to its due motion by lessening the quantity of blood by phlebotomy, which is indicated to be necessary by the signs of a plethora (§ 106, to 107.)

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^a Schedula monitor. de novæ febris ingressu, pag 660.

^r Hippocrat. de locis in homine cap. 10. Charter. Tom. VII. pag. 369.

It was said that the general cure of fevers consisted in four indications (§ 598.); namely, the life and powers of the body are to be maintained, the acrid irritating matter is to be corrected and expelled, the lentor or obstructing matter is to be resolved and expelled, and lastly the urgent symptoms are to be mitigated. We have already treated of the two former indications, and we come now to consider in what manner the lentor ought to be resolved and expelled. But we declared in the comment to § 598. N°. 3. that every obstacle impeding the free course of the blood through the extremities of the vessels, was comprised under the general term of a lentor, whether following from some fault of the vessels, of the fluids, or of both together. The method of learning therefore requires us to treat of these separately; and therefore in the present and following aphorism we shall speak of removing those obstacles which arise from the fault of the vessels, and then in the next following aphorisms we shall describe the cure of a lentor arising from a fault of the humours flowing through the vessels.

When a lentor arises from a defect of the vessels, it must be from too great a narrowness of their capacity; but this diminution of their capacity proceeds either from a natural contraction of the vessels increased, of which we shall speak in the next aphorism, or else from an external compression of the vessels from a distension of the adjacent parts, concerning which we are to treat at present. Among the very many causes which may compress the vessels externally, which we reckoned up in order at § 112. there is hardly any but the plethoric tumor can take place so as by this means
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to cause a febrile lentor ; for the other causes there enumerated injure only particular parts, and the plethoric tumor only is able to lessen the capacity of the vessels throughout the whole body.

For a plethora (as was said afore at § 106. N°. 1.) is too great a quantity of good blood ; but the blood properly so called, namely the red mass, is composed of the largest particles of any in our humours, and therefore it naturally is confined only to the larger vessels ; for although it may enter into the smaller vessels by an error of place when their orifices are dilated (see § 118.) yet it cannot pass through their ultimate extremities or anastomoses, but will there hesitate without being able to move further. The quantity of blood then being increased will more distend the larger vessels, and by that means the smaller vessels next adjacent to the larger distended ones will be compressed and lessened. The sanguiferous veins being more lax may be always more easily distended than the arteries ; but when these veins are filled with an increased quantity of blood, the arteries will meet with more difficulty of discharging their blood into them, whence the arteries themselves will become more distended. But since in most parts of the body, the arteries and veins accompany each other, therefore the distended arteries will press upon the leis resisting veins, and by that means propel the blood through them towards the right ventricle of the heart, from whence again it will soon be propelled into the distended arteries. Hence it is evident, that at length almost all the blood will be accumulated in the arteries of those who are highly plethoric. But when the contraction of the heart urges the blood into the now very full

arteries, the serous and lymphatic arteries which arise from the sanguiferous, will be so far dilated as to admit the red blood, as appears evidently in the tunica adnata of the eye, and in the whole skin, which is often very red in plethoric people; and thence these vessels also being dilated will compress the smaller adjacent arteriolæ. But when this is also accompanied with a fever, the heat thence arising rarefies the blood, and therefore all these evils will be consequently increased. Thus we sometimes see the whole body suffused with redness, while at the same time the roughness and driness of the skin, tongue, fauces and internal parts of the mouth teach that the smaller vessels are impervious, being compressed by a true thlipsis or strangulation from the larger vessels being over turgid with too much red blood.

But the signs of a plethora, which denote that this fault attends, have been enumerated before at § 106. N°. 4.

In order therefore to restore the due motion and fluidity to that which stagnates at the extremities of the arteries from this cause, it is required to make a sudden diminution of the quantity of blood, by which the larger vessels are distended, which may be most commodiously done by opening a vein (see § 106. N°. 6.) But the quantity of blood to be taken away is to be determined by the patient's strength, age, more or less plenitude or rarefaction and heat arising from the fever. Hence Celsus^s very well observes, where he treats of taking blood from the veins, *Ergo vehemens febris, ubi rubet corpus, plenæque venæ tument, sanguinis detractionem requirit.* "Therefore a violent fever
" wherein the body looks red and the large veins
" swelled, requires blood to be taken away."

But

• Lib. II. cap. 10. pag. 78.

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But although the only and most necessary remedy in such a case is bleeding, yet it sometimes happens in plethoric people, that after phlebotomy, the fever which was before low rages violently; and the reason is, that before the quantity of blood was so great, and its rarefaction so high by the febrile heat, that it suffocated all the motion or action of the over distended vessels, which they recover again so soon as the distended mass is lessened by bleeding. Therefore in such a case the physician ought to advertise the patient or his friends that there is greater danger of a rupture in the vessels from their too great fulness, to prevent which bleeding is necessary; and yet that after a vein has been opened, it must be expected that the fever will increase, though at present it appears mild and suffocated. Such a case Sydenham^{*} tells us happened within his own practice, for being called to a young man who seemed to be ready to expire, though at the same time the external parts of his body were so moderately warm that the patient's friends would not believe Sydenham whenever he affirmed he had a fever: but blood being plentifully drawn, there presently ensued so great a fever, that he confesses he never saw one more violent, though it ceased at length after three or four bleedings. The celebrated Boerhaave in speaking to this aphorism, used to tell us of a like instance which he met with: namely, of a plethoric man who drank a great quantity of wine in the midst of summer, but the next day walking through the streets was struck stiff like a statue; but after a while by a very bold phlebotomy he returned to himself, but immediately had a violent fever, by the force of which the

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rarefied

^{*} Schedul. monitoria de novæ febris ingressu pag. 683.

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rarefied blood burst open the orifice of the vein,
although it was secured in the usual manner by
ligature, and bled to such a quantity that the next
day he was found in bed in a manner swimming in
his own blood, but at the same time well and with-
out any fever.

But in the comment to § 106. N°. 6. it was de-
monstrated that only blood-letting conduces to the
cure of a plethora, and that no good is to be ex-
pected from that diminution of the humours,
which is made by abstinence from food and drink.

S E C T. DCVIII.

WHATEVER hesitates at the ex-
tremities of the capillary arteries from
their fibres being contracted with a convulsive
force, so as to lessen their capacity too much,
is removed and set at liberty by relaxing the
fibres (§ 53, to 55.) and by removing the
acrimony which occasioned the contraction,
(see § 35, 36. 54. 66, 67. 88. 102, to 106,
127, 128.) from whence you may be sup-
plied with all the means necessary in this
case.

Anatomy teaches that all the arteries of the body
(except perhaps those only which belong to the
substance of the brain and cerebellum, and the
marrow of the bones) have muscular coats, which
give them a due strength, lest they should be over-
stretched or dilated by the blood impelled into
them by the force of the heart, and also that by
the force of their fibres they might continue to urge
forward the blood at the time when the heart is
dilating.

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dilating. But the amplitude of the cavity of the arteries is more especially determined by the force of these muscular fibres. If therefore by any cause the contraction of these fibres is increased, the arterial cavity will be lessened, and the particles of their contained fluid will hesitate chiefly towards the extremities of the capillaries, through which only single globules of the blood pass in succession with some difficulty; and therefore a small diminution or contraction of the arterial cavity must occasion obstruction in these parts of the vessels. But that the fibres of the vessels may be contracted with a sort of cramp-like or convulsive force, we are taught by the most certain observations. If any one suddenly comes out of a stove into a very cold air, the cutaneous vessels exposed to the air are so contracted that the person immediately turns pale, while the red blood is not able to pass through the cutaneous arteries contracted by the cold. The same also evidently appears when the most healthy person is suddenly struck with fear; for they instantly resemble the image of pale death: the cutaneous vessels being suddenly contracted with a convulsive force, repel back the blood into the larger trunks, whence at the same time there follows an anxiety or oppression, a palpitation of the heart, fainting fits, &c. while the free circulation is impeded through the contracted vessels.

But whether this contraction of the fibres proceeds from such a sudden spasm, or from any other cause increasing their force (see § 113.) the whole cure will consist in relaxing the fibres, so that they may more easily give way to the impulse of the humours, and not lessen the cavities of the vessels by their too forcible constriction. Every thing therefore serving to the cure of too great rigidity

Of the vessels and viscera, and which have been explained in the aphorisms above cited, will likewise conduce to the cure of the present case. But among these nothing is more efficacious than the vapours of hot water, by which remedy only the most rigid and inflexible parts of the body may be restored to their due softness and flexibility; whence it is that in ardent fevers, where the whole surface of the body appears dry and rough, it is so extremely useful for the patient to keep his feet in warm water, and to let the vapours which thence arise communicate with the whole naked surface of his body. But the vapours of water may be either applied to the external surface of the body only, or else come into contact with the internal surface of the lungs, being drawn into them together with the air: but when the vessels in the internal parts of the body are contracted with a convulsive force, all those parts ought to be moistened and relaxed by watery drinks and the injection of clysters. It is well known from daily observation, of what benefit it is to a person suddenly affrighted to immediately drink a large quantity of some warm watery liquor. For by that means the constricted vessels are well relaxed, and the equability of the circulation returns, which is often wonderfully disturbed by a cramp of the vessels induced by sudden fear.

And by removing the acrimony which occasioned the contraction.] We see plainly that the larger parts of our bodies are violently contracted by the application of acrid substances, and therefore it seems highly probable that the same action takes place in the smaller parts. If a grain of sand falls betwixt the globe of the eye and the very sensible internal surface of the eye-lid, the orbicular muscle of the eye-lids will then be contracted

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ed violently even against the will. If the fumes of burning sulphur are drawn into the lungs, that organ immediately contracts itself so forcibly, that it cannot be dilated by all the endeavours, but there is present danger of suffocation and death. It was said upon another occasion (§ 63.) that experiments upon living animals teach us that the intestines being lightly touched with spirit of vitriol, contract themselves immediately and so close together, as to intercept the least passage through their cavity, insomuch that air itself cannot be transmitted. The same thing happens from arsenic and other acrid poisons, as Wepfer has demonstrated in his history of the *Cicuta Aquatica*.

When therefore there is reason to suspect that the cavities of the vessels are diminished by a spasmodic contraction of their coats from an acrimony irritating the fibres, every thing will then be useful, which can either remove or weaken the acrimony. Diluent and oily medicines, which obtund all acrimony, are here of the greatest use, because they oppose every kind of acrimony, and at the same time relax the constringed fibres: in the most severe iliac passion linseed oil drank to the quantity of a pound, has saved many people out of the jaws of death; and only a plentiful drinking of warm water, and an injection of it clyster-wise, has destroyed the strong acrimony of corrosive sublimate, as we observed before from Sydenham (see § 605. N°. 6.) But these are medicines which avail against all acrimony, and at the same time relax and soften the fibres of the vessels. But when the particular kind of acrimony is known, which by its irritation increased the contraction of the vessels, then medicines opposite to that acrimony must be used. But concerning all these particulars we have treated before at the numbers cited in the present aphorism,

as

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as also at § 605. from whence these medicines may
be therefore taken.

S E C T. DCIX.

THAT which hesitates at the extremities of the capillary arteries through its own viscid and sluggish nature, may be resolved by various remedies; the chief of which is the force of the fever itself so moderated, as that it may be able to dissolve the febrile coagulum (§ 587, 589, 593, 594.) and therefore this requires the violence of the fever to be governed in such manner, as 1. That it may not be able to produce inflammations, suppurations, gangrenes or sphacelus (§ 592); the danger of which events being at hand appears from the violence of the symptoms, more especially of the heat compared with the action of the arteries. 2. That the thinner humours may not be dissipated by a too great motion of them; which ill effect is known from the driness of the nostrils, eyes, throat and tongue, a hoarseness, dry and rough skin, little urine, and the pulse small, quick and unequal. 3. Nor yet to let the force of the fever subside or languish too much before the concoction, whence it might not be able to subdue, remove, discern and discharge the matter of the disease; as may be known if the vital actions are altogether languid, without any sign of a concoction yet appearing.

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We come now to treat of that lentor or hesitation, which proceeds from the fault of the fluids themselves flowing through the vessels. It was said in the comment to § 110. that there is a certain degree of cohesion required in our healthy humours: but since the particles of the blood are observed to pass only one at a time through the ultimate extremities of the capillary arteries, therefore the cohesion of one particle to the other in the blood, ought to be such as will yield to the powers by which the humours are drove through the vessels. When therefore this cohesion of the particles or globules of the blood is by any cause so increased, that it will not yield to the action of the heart and vessels, it is then called a lentor or viscosity. But this lentor sometimes pre-exists before the fever arises, and sometimes it happens from and during the fever. Thus we see these spontaneous lassitudes, which denote an imperviousness of the humours through the vessels, often precede acute diseases; and on the contrary, that a fever raised, for example, by the stimulus of the contagion of the small-pox, communicates an inflammatory lentor in the space of a few days to the blood of a person who was before perfectly in health. But whether this lentor preceded or followed after the fever, it is still required to be removed in order to effect a cure; since otherwise the equability of the circulation cannot be restored throughout all the vessels, which yet is absolutely necessary to perfect health. Many remedies are recommended for this purpose; but that which merits the greatest preference to all the rest, is the force of the fever so moderated itself, that it may be able to dissolve the febrile coagulum.

It may perhaps seem surprising that the fever itself should occasion the coagulum, and again dissolve the coagulum after it is formed; but if we consider

consider what has been said in the effects (§ 587, and 589.) together with what is related concerning the various events of fevers (§ 593, 594.) it will be sufficiently evident that both these effects of the fever are not in the least contradictory, but actually take place according to the different duration and intensity of the fever. For we are certain that too violent a force of the fever expels the most fluid parts of the humours, and inspissates the rest, and therefore a lentor ensues in the fluids, or that lentor already formed is increased: but in the mean time it is likewise evident, that by a moderate force of the fever those humours are attenuated and dissolved which were concremented, by which means the lentor is removed, as we demonstrated in the places before cited. All therefore here required is so to moderate the force of the fever, that it may not be too weak to dissolve the febrile coagulum, nor yet to let it be too violent, whereby it may destroy the tender solids, and coagulate the fluids.

This simple method has displeased many, who have believed it unworthy a physician to stand so often as a spectator in the cure of diseases; and not only this opinion, but also the slowness of the advancing cure often excited both the patient and the physician to fall into other methods, and to try almost every thing to remove the obstacles, or suffocate the fever, the very name of which is odious to the unskilful. For, say they with Asclepiades, it is the part of a physician to cure quickly, as well as safely and pleasantly. But, as Celsus^a very well observes, in treating upon these matters, *Id vultum est: sed fere periculosa esse nimia & festinatio & voluptas solet.* “The studying too much of haste
“and pleasantness in the cure of diseases, however
“desirable, is yet commonly dangerous.” I wish
this

^a Lib. III. cap. 4. pag. 117.

this admonition to be observed by those physicians, who make it their practice to suppress indiscriminately the force of almost all fevers by repeated bleeding. Even Celsus * complains of the same thing in his time, when he says, *Sanguinem incisa vena mitti novum non est; sed nullum pene morbum esse, in quo non mittatur, novum est.* "It is nothing new to let blood in fevers by opening a vein, but to bleed almost in every disease or fever is a practice new or uncommon." On the contrary, it has been customary with others to increase the febrile motion by the hottest medicines, when it is of itself already too violent, namely, with a view to dissipate or carry off the matter from the body by a diaphoresis; but how rashly this is often attempted has been said before. Others again disturb every thing with equal audaciousness and ill success by purges, vomits, &c. But the wise ancients exactly following the footsteps of nature in the cure of diseases, have placed the best method of cure in keeping a fever under a due regulation, and condemned those physicians who believed that they did not proceed according to art, unless they opened a vein, injected clysters, &c. (see concerning this the comment to § 587.) for frequently, as the ancients have well observed, the best physick is not to use any. But, lest the slowness of the cure should give occasion for departing from this high and secure way, and proceed to try other methods, Hippocrates x gives the following salutary admonition to his successors, *Omnia pro ratione facienti, si ex ratione non succedant, non ad aliud transfundum est, manente illo, quod ab initio decretum fuerat.* "That although things do not succeed according to wish or expectation under the care of one who proceeds

* Lib. II. cap. 10. pag. 77.
Charter. Tom. IX. pag. 88.

x Aphor. 52. Sect. II.

“ proceeds in a just and rational method, yet he
 “ ought not to pass over to another method, so
 “ long as that continues which induced him to
 “ prosecute the method at first.” The incomparable Sydenham, who is never to be mentioned without an encomium, having arrived to the greatest perfection of art by a diligent attention to diseases, when he saw a sleepy stupidity from a lentor of the humours flowing through the vessels of the encephalon in fevers, confesses that he left no stone unturned, but tried repeated bleeding, blistering, clysters, &c. to remove it, but in vain; whence he ingenuously confesses that afterwards he made no farther attempts of the like kind, only prohibited his patients from flesh-meats and spirituous liquors of every kind, namely to prevent the increase of the fever. But when he attended to learn by what method nature endeavoured to conquer this symptom, that he might follow it for the future, he was surprised to find that the disorder which he regarded, at last disappeared safely though slowly. Hence he justly concludes, *Nos in morbis depellendis haud satis lente festinare; tardius vero nobis esse procedendum, & plus naturæ esse committendum, quam nos hodie obtinuit. Errat enim, sed neque errore erudito, qui naturam artis adminiculo ubique indigere existimat. Namque id si fieret, parcius humano genere ea prospexisset, quam postulat speciei conservatio: cum ne minima sit proportio inter morborum ingruentium frequentiam, & facultates, quibus pollent homines ad eos fugandos, vel eis seculis, quibus medendi ars maximè caput extulit, & a quam plurimis exculta est.*
 “ That we do not proceed slow enough in removing diseases; and that we ought to advance with
 “ less haste, and commit more to nature than is customary among us at present. For he is in an
 “ error, and not in a learned one, who thinks that
 “ nature

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“ nature is always to be directed by the assistances
“ of art. For if this took place, nature would
“ have dealt more hardly with mankind, than is
“ consistent with the preservation of the species :
“ since there is not the least proportion betwixt the
“ number of diseases, and the faculties or powers
“ with which mankind are endowed to avoid and
“ surmount those diseases ; and this even in those
“ ages, wherein the art of healing has been raised
“ to the greatest pitch, and cultivated by the
“ greatest number of physicians .”

For nature makes use of the fever to separate the pure from the impure, to dissolve what is concreted, to attenuate and subdue what is tenacious and resisting, and to expel what is subdued from the body by various passages, if it can be no longer obedient to the laws of health (see the comment to § 558). All this is sufficiently evident from what has been said before. But although we easily know the fever once produced, yet the cause which excited it is not always distinctly understood ; but it is only in the physician's power to observe the effects which from thence arise, that he may learn by what methods nature endeavours to conquer the disease, and by what passages the material cause of the disease may be expelled from the body, whether existing before the fever was raised, or generated by, or during the time of the fever. This being known, he may be able to imitate the method which he has observed by art, he may ease the passages, remove the impediments, and supply what is deficient. But since nature uses different spaces of time to perform all these, requiring only sometimes a few days, at other times as many weeks, it is again evident that the patient's interest is very badly consulted, if the force of the fever is allayed too

too soon. Hence Sydenham lays down the following general indication in the cure of fevers, *Ut sanguinis commotio intra modum, naturæ proposito congruentem, sistatur; ea nimirum ratione, ut nec hinc plus æquo gliscat, unde periculosa symptomata insequi solent; nec illinc nimium torpeat, quo pacto vel materiæ morbificæ protrusio impediretur, vel sanguinis, novum statum affectantis, labefactarentur conatus.*

“ Namely, to keep the motion of the blood within
 “ the due bounds proposed by nature, so that it
 “ may neither rise so high as to be attended with
 “ dangerous symptoms, not yet fall too low, so as
 “ to hinder the expulsion of the morbid matter,
 “ or obstruct the endeavour of the blood to acquire
 “ a new state.”

It will be therefore of the greatest use to know those signs by which it may be distinguished whether the force of the fever is too violent or too weak; and then those remedies are to be pointed out by which the too great force of the fever may be lessened, or else raised when it is too weak.

1. By a fever the motion of the humours thro' the vessels is increased; but then, as we observed in the comment to § 592, while the sides of the transmitting vessels retain the same firmness, the impetus and velocity of the fluid to be transmitted is increased, whence necessarily follows a greater distraction of the sides of the converging vessels, which may even burst from this cause. But from a sudden rupture of the vessels follows a destruction of the circulation of the humours through the part affected with a gangrene and sphacelus, that is a death of the part; and therefore if the impetus is so great as to threaten these, it must be lessened. But if the sides of the vessels are distracted without a rupture, their cavity will be dilated so as to
 admit

z Sydenh. Sect. I. cap. 3. pag. 61.

admit the grosser fluids to pass into the smaller vessels; so that obstruction, inflammation, and all their consequences may follow from an error of place. But an inflammation arising in external parts, from too great a force of a fever, does not require so great caution, because if it comes to suppuration the matter formed may be discharged without danger to life; but when inflammations arise from too great a force of the fever in internal parts, it is very evident how much danger attends, and how carefully all the endeavours of art should be used to prevent a suppuration, and much more a gangrene.

But if those preternatural symptoms which arise from the fever, as the cause in the body of the patient, and yet may be distinguished from the fever and its proximate cause, are very severe and increase very suddenly in the number and malignity, we justly conclude that the force of the fever is too violent, and that it ought therefore to be moderated. But since new symptoms often precede a future crisis, or else the present symptoms are increased, therefore there may be some doubt in this case; as also because sometimes the worst symptoms arise from the malignant nature of the material cause of the fever, even though its force is not excessive, but is often too languid. But the most certain sign of all that the force of the fever is too great, may be had from the heat which arises from the more violent motion and attrition of the parts of the fluids against each other, and against the sides of the vessels (as will be demonstrated hereafter at § 675): for a great heat denotes a narrowness of the vessels, and thickness of the humours, a violent propulsion of them and great resistances about the extremities of the arteries: and therefore it is evident, that when a fe-

* Herm. Boërh. Instit. Medic. § 968.

ver is accompanied with intense heat, there is great danger of a destruction of the solid parts, more especially of the final vessels. But at present we are able to measure the degree of heat in healthy people by the thermometer, and by this means we can see how much the violent heat in the febrile patient exceeds that degree; and from that excess being known, the different degree of danger may be prefaged.

But it is of great consequence to know in what part of the body this increase of heat is perceived; for since by the heat we know that the vessels suffer great violence, the greatest danger will be where the vessels are most tender, and the most necessary for the continuance of life. Hence if there is an intense heat seizes the head of a febrile patient, we have just reason to fear a delirium, convulsions, or phrenzy often suddenly fatal: and therefore that the most efficacious remedies must be immediately used. For this reason all the antient Physicians so much condemn a great heat about the breast and præcordia, though the other parts of the body are only moderately warm, or even sometimes when the extremities are cold. For the vital viscera with the liver, spleen, &c. are then known to sustain too great a force from the fever, and therefore the worst consequences are to be feared, unless immediate relief be given.

2. It was made evident in the comment to § 100 and 587, that too great a quickness of the circulation dissipates the most fluid parts of the humours, and inspissates the rest, and that therefore this is justly ranked among the effects of a fever: For the secretion and excretion made from the rest of the humours will be in proportion (*cæteris paribus*) to the quantities of them applied in a given

a given time to the secretory and excretory organs; and therefore by too great a violence of the fever, the most fluid parts are expelled; and the blood being deprived of its diluent vehicle, grows thick, and begins to hesitate every where about the smallest extremities of the vessels; whence again there is danger of inflammation, suppuration, &c. That there is such a deficiency of the most fluid parts of the blood we know, if those parts of the body which are naturally moist, begin to grow dry. The whole skin is lax, soft, and moist in healthy people; the internal parts of the nose are always moist, the eyes are continually watered with a very thin lymph; the tongue, palate, fauces and gums are likewise equally moist. But so soon as the most liquid part of the blood begins to be wanting in fevers, immediately a greater driness appears in these parts; and hence it is usual for skilful Physicians never to leave the patient without first inspecting the internal parts of the mouth. This is the reason why Hippocrates in his Prognostics, condemns a driness of the eyes with a dimness or loss of their splendor, which yet proceeds from driness: and in another place^b he says, *Densa lingua & arida phrenetica: Perniciosum autem est dentes sicari.* “A dry and thick-covered tongue denotes a phrenzy; but it is pernicious for the teeth to be dry.” And again, *Quibus autem dentibus lentores adnascuntur in febris, febres fiunt vehementes.* “That those have violent fevers, who have a thick and viscid matter growing about their teeth in that disease^c.” For the same reason also, namely, the too great driness of the instruments of vocification, the shrill voice (*ὄξυφωνία κλαγγώδης*^d) is esteemed a very bad sign;

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^b Prorrh. Lib. I. textu 3. Charter Tom. VIII. pag. 698. & Coac. Prænot. No. 235, 236. *ibid.* pag. 865. ^c Aphor. 53. Sect. IV. Charter. Tom. IX. pag. 169. ^d Hippocrat. Lib. I. Prorrh. Charter. Tom. VIII. pag. 732.

and even Hollerius* testifies, that he never saw one recover who had such a voice, which he describes in the following manner; *Est autem subrauca, sed acuta fere & sonora, gravis aliquando. Similis refertur, si quis in fictile siccum aut cavum ædificium caput immittat, atque inde loquatur.* "That it is sharp and almost singing, but with
 " a little hoarseness, and sometimes grave, resembling the voice of one speaking with his head
 " in a dry earthen vessel, or in a hollow building." When any person has travelled through sandy countries, under great heats of weather, a dryness of the fauces occasions such a kind of voice.

But since a great deal of water is discharged with the acrid oils and salts of the blood separated by the fabric of the kidneys under the form of urine, therefore little urine denotes that the blood circulates through the kidneys almost deprived of its watery vehicle, and therefore that there is too great a dryness throughout the whole body.

But the most fluid parts of the humours being dissipated, the blood now being thicker will pass more difficultly through the ends of the pulmonary artery; therefore the blood will begin to hesitate and be accumulated in the lungs, through which a small quantity only will be able to pass into the left ventricle of the heart, which not being sufficient to dilate powerfully the larger arteries, will occasion a small pulse: and because a greater difficulty or resistance arises against the right ventricle of the heart from the infarction of the lungs, it will not be able to entirely empty itself, whence it will palpitate or contract more swiftly: hence the pulse will be very quick as well as small; and lastly, it will be unequal or intermitting, denoting that life is in a manner deficient at
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* In Coac. Hippocrat. pag. 155.

intervals from the extreme difficulty of the blood's passage through the lungs, whence it is sufficiently evident how great danger is then present.

When therefore the signs denote that the violence of the fever is so great, that there is danger of the most fluid parts of the humours being dissipated, and that the blood will in a little time hesitate immoveable in the smallest extremities of the vessels, therefore the fever ought to be lessened by all the endeavours of art to avoid these fatal consequences. Hence it is also evident how badly the interest of the patient is consulted, when the most fluid parts of the blood are expelled in sweats at the beginning of the disease. Sydenham affirms, that he always observed the very worst consequences from this practice in the small-pox; and he assures us that the remaining course of the disease turned out the more dangerous, as the Physicians had been more assiduous in promoting sweats during the first stage of the small-pox.

3. In the comment to § 587, where we treated of concoction as an effect of the fever, it was said, that by this term was understood such a change of the material cause by the fever itself as rendered it less hurtful, and disposed to be discharged conveniently out of the body; but that the febrile motion under a just moderation is the principal cause of this concoction, is also demonstrated in the same place. Whence it is evident, that the fever being suppressed before this concoction, or so weakened that it cannot exert in power, the worst consequences may thence follow; not so swiftly indeed as those which arise from a destruction of the vessels and coagulation of the fluids by the raging violence of the fever; but slow, chronical, and very difficult diseases often follow when the fever is not sufficient to move and mature its material cause.

When an inflammation raised in any part of the body is such that it cannot be resolved, the best thing that can then be done, is to change the inflammatory and inspissated coagulum by a mild concoction into pus or matter : but this can never be performed without a fever ; and if this fever in such a case happens to be violent, it causes a gangrene ; if the fever is too low, it is not able to effect a concoction, nor produce a mild suppuration, but often an incorrigible schirrous hardness remains during the rest of life. After the very hottest summers, it often happens that in the autumn following, people are afflicted with a slight obstruction of the liver, attended with a slow fever sometimes continual, and sometimes remitting ; and if the fever continues longer, it changes to the class of intermittents. When the strength has been too much weakened by frequent and too copious bleedings, all the force of the disease is indeed suppressed, but the unfortunate patient languishes, and by degrees falls into a cachexy, an obstinate jaundice, or a dropsy ; and sometimes in the following spring a putrid dysentery immediately weakening the vital powers, has proved fatal. The same misfortune also happens to many who have been cured of autumnal intermittents by a too hasty use of the Peruvian bark. For after the fever is removed the obstacle remains in the liver, for dissolving and expelling which the fever itself is the greatest remedy, if kept under a just moderation.

But we know that the febrile motion is too low or dull, if the pulse is languid and weak, the powers suppressed, the urine of a pale colour, the heat small, and no where more intense than in the healthy cold temperature. If under these circumstances there is no sign that the universal or topical

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tal disorder which accompanies the fever is relieved, we then know that the material cause of the disease is not yet subdued, and that the impetus of the fever is too weak to subdue, move, separate, and expel the same. For when the material cause is by the fever itself dissolved, and again assimilated with the healthy humours, so as to circulate with them, (see § 595) or the same matter being subdued and rendered moveable, but being possessed of such qualities as are repugnant to the equable circulation, it is either expelled from the body, or deposited upon some certain part (see § 593, 594); whereupon the febrile motion ceases, and with a very ill presage; nor is there any reason then demanding an increase of the motion. But when the matter is thus altered, the signs of concoction always appear first; and for this reason it is added in the text, without any sign of concoction yet appearing. For example, if after bleeding too often repeated in a pleurisy, there remains a dry cough, or a thin watery humour which cannot be coughed up without difficulty, and the pain, though more obtuse, continues in the affected side, the urine becomes thin and without any sediment, or remains thick and turbid without depositing any thing to the bottom, and at the same time there is a weakness of the vital actions: I then see that the impetus of the fever is too dull or languid, because there is no apparent sign of concoction, and the local malady peculiar to the disease remains unmoved. For that a concoction is present we know from the decrease of the disease and diminution of the symptoms, while at the same time the vital powers either remain firm or increase, and the injured functions begin to recover their healthy state, while the excreta put on the appearance of those qualities which are observed in them during health.

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Therefore before these signs appear, it will be always injurious to depress the force of the fever, unless it should rage so violently as to threaten a destruction of the very tender solids, and too great an inspissation of the fluids. The heat therefore in such a patient ought to exceed the heat in a healthy person, and the quickness of the pulse ought to be something more than natural. At the same time it is evident, that no very general rule can be given for the cure of fevers, since what is useful in one case may be highly prejudicial in another. Those are therefore equally criminal who endeavour at the cure of every fever by bleeding, clystering, &c. with those who upon all occasions make use of cordials, stimulating and moving medicines, &c. Nor can the Physician be said in this respect to perform the part of an idle spectator, since there is need of the greatest prudence to see whether any thing, and what ought to be done. He will be the best Physician who “orders the in-
“offensive flames of the fever to exert themselves
“easily upon the body, and who moderates the
“rapidity of its fire by a just regimen’.”

*Innocuas placide corpus jubet urere flammæ
Et justo rapidos temperat igne focos, &c.*

† In Carmine præfixo operibus Sydenhami.

SECT.

S E C T. DCX.

IF therefore the impetus of the fever is found to be exorbitant, it may be moderated (§ 101.) by abstinence, a thin diet, drinking of water, a cool air, slight affections of the mind, bleeding, cooling clysters, mild, watery, glutinous, and cooling medicines, with anodynes and opiates. See § 92 to 106.

It now remains to be enquired by what remedies we may moderate the fever, when its impetus is too great. But of this we treated before in speaking of diseases arising from excess of the circulatory motion. But this is performed chiefly

By abstinence.] It is not here intended that the patient ought to abstain from all food and drink, but only from such as either by their quantity or quality may increase the blood's motion, which is already too violent.

By a thin diet.] Such as may be easily digested and moved freely without resistance through all the vessels. Hence the decoctions of barley, oats, rice, bread, &c. are of the greatest use (see what has been said in the comment to § 599). For since even in healthy people foods of a difficult digestion often excite a fever, because they cannot be subdued but with great uneasiness by the concocting powers, it is sufficiently evident, that the same disorder ought to be expected more especially in those who are already ill of a fever, where many of the functions to be employed in that office are languishing; and therefore only the thinnest

nest aliments can be administered, since the too great force of the fever ought to be quieted.

Drinking of water.] The greater quantity of water abounds in the blood, so much the cooler is the body, and the weaker the powers. In leucophlegmatic and pale girls the blood is found poor, and of an ill watery condition; but then there is observed a coldness of the whole habit, and great weakness. So long therefore as there is too great a heat and quickness of the circulation present, the drinking of water, more especially warm, can never be hurtful, since by relaxing the solids and diluting the fluids, it will abate their motion. But at the same time, as we observed before (see § 605, N^o. 6.) all acrimony which is so frequently the cause of an increased motion in the blood by its stimulus, may be so weakened by diluting with water, as to be no longer offensive. Even every one who is ill of a violent fever, unless the mind is disordered, has by a natural instinct a very great desire for water and watery drinks. Sydenham^s affirms, that he has cured incipient fevers only by abstinence and thin drinks, both in his own children and friends, although they were permitted their usual exercise and free air.

Cool air.] It was the opinion of almost all the Physicians of the last age, that all fevers might be cured with the greatest safety and expedition by a diaphoresis. Hence they detained the patient in a very hot air, covered and even loaded with bed-cloaths, that the surface of the body being fomented by the heat, might be better disposed to discharge sweats. But this was adding fuel to fire, to the great damage of the patient, and exasperating the force of the fever. But more especially they insisted upon this method in those fevers which
were

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were accompanied with cutaneous eruptions, such as the small-pox, measles, &c. Sydenham was almost the first who courageously opposed himself to the torrent of this practice, than which nothing can be more pernicious, as he declares in several parts of his works. But he found it one of the most efficacious remedies for quieting the too great force of the fever, to let the patient abstain from his bed for a few hours, and sit with an erect posture of body in a chair, or at least to put on his cloaths and lie down upon the bed not covered with any other cloaths, if the greater weakness prevented from sitting up; that by this agreeable cooling the too great burning heat of the fever might be moderated^b. But of so great moment is this method, that he affirms, that neither plentiful bleedings nor any other cooling remedies were of service in the cure of pleurisies, if the patient was perpetually confined to his bed^c: for the inspired air serves to cool the blood heated by its very swift motion through the pulmonary arteries; but if the patient is kept in a very hot atmosphere by being covered up with bed-cloaths, it is evident enough that none of this cooling can be expected, and therefore the heat must be increased. To expose a heated body suddenly to a very cold air would be rash; but to temperate too great a heat of the body by such things as are recommended at § 605 N^o. 2. can never be injurious. But even this is ingenuously confessed by Sydenham^k, that sometimes, though rarely, if the patient abstained from his bed longer at one time than was convenient, especially in the declension of the disease (namely in a continued fever), they would

^b Sydenham pag. 282. ^c Ibid. Sect. VI. cap. 3. pag. 337.
^k Sect. V. cap. 2. pag. 283.

would be sometimes taken with wandering pains, which might terminate in a rheumatism; and sometimes the body would appear discoloured, as in a jaundice. But if this happened only in the declension of the disease when the heat is milder, they might then more safely have kept to their bed, and have easily got over these complaints. But it is sufficiently evident, that caution may be used not to let the patient be too long absent from his bed; and the air where the patient lies may be so tempered as to prevent it from doing any injury by its coldness.

There is an observation in the Memoirs of the Royal Academy of Sciences¹, which demonstrates how much abstaining from the bed will sometimes conduce to a quiet fever. For the febrile paroxysm inflexible to all known remedies was prevented, if the patient did but sit up in a chair, and not keep to his bed.

Slight affections of the mind.] That violent passions of the mind sometimes excite fevers of the worst kind, has been said before in the comment to § 586. N°. 3. for which reason passions of the mind were reckoned among the causes increasing the quickness of the circulation. (§ 99. N°. 1.) When therefore the febrile motion is to be lessened, it is evident enough that all affections of the mind ought to be moderate; but in what manner they are to be moderated, was said before in the comment to § 104, and 605. N°. 5. Every thing therefore is to be here avoided which can powerfully affect either the external or internal senses; the patient should be kept to a dark chamber, free from all noise; that as Celsus observes, *Semper ægros securos agere conveniet, ut corpore tantum,*

non

¹ L'An. 1732. Hist. pag. 42.

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non etiam animo laborent. “The patient ought
“always to be kept secure from disturbance; that
“his mind may not be disordered as well as his
“body^m.”

By bleeding.] What have been hitherto advised for the restraint of the too great force of the fever, are indeed all of the greatest use, tho’ they cannot produce their effects so soon as we could wish; when therefore the violence of the fever is such, that there is danger of destroying the very tender vessels coagulating the humours by dissipating the moisture, and increasing the heat so that they cannot afterwards be dissolved by any art, then the great danger requires the immediate use of the most efficacious remedies, by which we are certain the febrile motion may be soon diminished. But such a remedy is afforded by opening a vein; for we can thereby diminish the motion of the humours at pleasure, even unto death, which is an absolute rest of the whole; and therefore we may reduce the force of the fever to a just moderation in proportion to the quantity of blood which is drawn. This matter has been demonstrated by the incomparable philosopher Dr Stephen Hales, to whom we owe many and great improvements; for after opening the blood-vessels of living animals, he adapted glass-tubes to see to what height the blood would ascend into them by the impulse of the heart and blood-vessels. He afterwards remarked how much the height of the blood lessened after drawing out different quantities until the animal at length expiredⁿ. From which experiments it appears that lessening the quantity of the blood weakens the motion of the circulation. But how

^m Celsus, Lib. III. cap. 5. in fine pag. 127.

ⁿ Hales’ *Hæmstatics*, p. 1, &c.

how great efficacy phlebotomy sometimes has in the cure of fevers, is evident from the remarkable instance which was mentioned in the comment to § 54. N°. 2. where Galen so happily removed the disease by one bleeding, but continued to fainting in a plethoric and robust youth, that they who stood by told him he had killed the fever. Hence in the most ardent fevers and great inflammations with intense pains, he placed all his hopes in such a kind of bleeding (see the comment to § 141. N°. 1.) But altho' venesection is often required in so plentiful a manner 'till the patient faints away in the most severe and dangerous fevers, yet in other cases it should be moderate: for if by this means the vital powers are so depressed as to leave no fever while the lentor still remains, which can only be rightly subdued by the fever, a good cure can never succeed. If after some hours or later the force of the fever begins again to rage, a vein may be opened a second time, and repeated again, 'till the remission of the heat and mildness of the symptoms indicate that nothing more of danger is to be apprehended from the violence of the fever; but always taking care not to run on the other extreme, that is, not to dull or weaken the fever too much.

But although greater caution seems required in the tender infant, in old age, and in women with child (which last Hippocrates^a tells us miscarry by opening a vein, especially if the foetus is large); yet even in these bleeding ought not to be neglected, if there seems any danger from the too great violence of the fever. Sydenham^p observes, that young infants may be safely bled in a quantity proportion-

^a Aphor. 31. Sect. V. Charter. Tom. IX. pag. 213.

^p Sect. IV. cap. 5. pag. 248.

portionable to their strength, and I have myself often experienced the benefit of it. For, as Celsus^a well observes, *Interest enim, non quæ ætas sit neque quid in corpore intus geratur, sed quæ vires sint, &c.* Cum præcipua in hoc ars sit, quæ non annos numeret, neque conceptionem salam videat, sed vires æstimet, & ex eo colligat, possit nec ne superesse, quod vel puerum, vel senem, vel in una muliere duo corpore sustineat. “ We are not so much to
 “ consider what the age is, or what is done in the
 “ body, but rather the condition of the powers,
 “ &c. because in this the art principally consists,
 “ not in considering the number of years, nor the
 “ state of gravitation only, but to estimate the
 “ powers or strength of the body; and from
 “ thence one may collect whether the patient can
 “ survive or not, whether in a child, an old per-
 “ son, or in a woman who has a growing foetus
 “ to support as well as herself.”

I am not ignorant that a sentence, thrown by Celsus^a in the same chapter, has raised some scruple on this account; namely, *Quod si vehemens febris urget, in ipsa ejus impetu sanguinem mittere, hominem jugulare est.* “ That if a violent fever
 “ urges, to let blood in the height of it is to kill
 “ the patient.” But Celsus does not seem to know the use of bleeding so far as it temperates the violence of a fever, but he only recommends it as lessening the quantity, or removing what is vitiated: for he says^b, *Considerandum est, utrum superans, an deficiens materia læserit; corruptum corpus sit, an integrum: nam si materia vel deest, vel integra est, illud alienum est. At si vel copia sui male habet, vel corrupta est, nullo modo melius succurritur.* “ It
 “ must

^a Lib. II. cap. 10. pag. 77, 78.

^b Ibid. pag. 80. ^c Ibid. pag. 78.

“ must be considered whether the matter offends
 “ by abounding or being deficient ; whether the
 “ body be corrupt or sound and entire : for if
 “ there is a deficiency of matter, or a soundness
 “ of body, bleeding is improper. But if the pa-
 “ tient is indisposed from too great a quantity or
 “ a corruption of the humours, there is no better
 “ way of relieving him.” But when Celsus pro-
 nounces bleeding dangerous, he speaks of the
 height of the fit in an intermitting or remitting fe-
 ver ; whence he immediately subjoins, *Expectanda*
ergo intermissio est, si non decedit, cum crescere desit :
si neque remissio speratur, tunc quoque, quamvis peior,
sola tamen occasio non omittenda est. “ That an In-
 “ termision is therefore to be waited for, or at
 “ least a remission, if the fever does not go en-
 “ tirely off: but if neither a remission can be
 “ hoped for, then indeed a single or necessary
 “ call for bleeding ought not to be neglected,
 “ though it may be worse.” From whence it is
 evident that he does not absolutely condemn bleed-
 ing even in the height of fevers. Nor is this cau-
 tion which he gives us without its use in fevers
 which intermit or remit ; for in the greatest height
 of a quartan, for example, there is often a very in-
 tense heat with a delirium and many other symp-
 toms which require bleeding, unless one is assured
 that the violence of the fever will spontaneously go
 off in a little time ; but then in general, bleeding
 is in itself always pernicious for intermitting fevers,
 as we shall declare hereafter at § 762.

But as bleeding serves thus to abate the violence
 of the fever, it is evident that no time can be pre-
 scribed beyond which it cannot be used without
 success. For in whatever time of the disease the
 fever rages so as to threaten the evils before men-
 tioned,

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tioned, (§ 609. N^o 1, 2,) bleeding will be both useful and necessary. But it is indeed true that in curing inflammatory diseases by resolution, after the fourth day bleeding is seldom useful, because the obstructing matter is by that time too much confirmed and strongly wedged into the vessels to admit of being resolved; and then there only remains a prospect of separating the inflammatory matter by a mild suppuration, which is always accompanied with a fever, and usually a more intense one, and the force of which ought therefore not to be diminished as it forwards the suppuration. And in this case only can that advice of Celsus^u hold true, where he says, *Sanguinem mittere nunquam utile est post diem quartum, cum jam spatio ipso materia vel exhausta est, vel corpus corrumpit, ut detractio imbecillum id facere possit, non possit integrum.*

“ That it is never useful to bleed after the fourth
 “ day, since after that space the matter is either
 “ exhausted or the body vitiated by it, so that
 “ taking blood from the patient then may weaken
 “ him but cannot restore him.” But even in these cases, if the fever is so violent as to endanger a sudden rupture of the small vessels by its too impetuous motion, (see § 388.) then a gangrene may be feared instead of a mild suppuration, and the fever ought to be reduced to such a degree of moderation as is required for a laudable suppuration. For it frequently happens that continual fevers are very mild for the first days, and afterwards they rage with great violence. (See the comment to § 564.)

Hence Galen^w justly pronounces, that we are not to attend to the number of days in blood-letting; *Quocunque enim die mittendi sanguinis scopos in ægotante inveneris, in eo illud auxilium adhibeto,*

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^u Ibidem. ^w De curandi ratione per venæsectionem cap. 20. Charter. Tom. X. pag. 449.

etiamſi vel vigefimus ab initio is exſtiterit. “ For
 “ on whatever day you meet with ſigns in the pa-
 “ tient which require bleeding, you ought to af-
 “ ford him that help immediately, even though it
 “ ſhould happen to be on the twentieth day from
 “ the beginning.” But the indications for this
 conſiſt in the violence of the diſeaſe and ſtrength
 of the powers. For I well remember myſelf to
 have ordered bleeding much later than this with
 ſucceſs.

Cooling clyſters.] This after bleeding is ano-
 ther moſt efficacious remedy, whereby the too great
 force of the fever may be tempered. But we
 here ſpeak only of thoſe clyſters capable of intro-
 ducing a coolneſs throughout the body, when it is
 too much heated by a violent fever. For it is
 well known that purges and vomits with any other
 kind of medicine may be advantageouſly applied
 this way. Sydenham † eſteemed clyſters ſo much,
 that he affirms he could quiet the too great heat of
 the blood at pleaſure only by the uſe of theſe, and
 that he had ſeldom occaſion for repeated bleeding
 in continual fevers, unleſs in thoſe which happened
 to people of a ſanguine temperament, or in the
 flower of their age, or indulging themſelves too
 much in wine: but in others it was ſufficient to inject
 a clyſter every day, or every other day, as the force
 of the fever was greater or leſs, until the violence
 of the diſeaſe was ſufficiently reduced, as it uſually
 happened about the tenth day, eſpecially in the
 common acute continual fever, which terminated
 in fourteen days. But in thoſe whom he durſt not
 bleed he continued to uſe clyſters to the fourteenth
 day; and ſuch were thoſe patients who had a con-
 tinual fever after they had not been well cleared
 from autumnal intermittents. For in theſe he had
 ob-

† Sect. I. cap. 4. pag. 69.

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observed blood-letting pernicious, which induced him to substitute the use of clysters in its stead. This is also well pointed out by Celsus^{*}, when he says, *Clysmata usum habere, si sanguinem mitti, cum opus sit, vires non patiuntur, tempusve ejus rei præterit.* "That the use of clysters takes place if the strength will not admit of bleeding when it is necessary, or if the time for bleeding has expired." Sydenham only made use of the most simple clysters composed of Sugar and an emollient decoction; sometimes only of water, or of water mixed with an equal quantity of milk. All these kinds of clysters cherish the bowels like an emollient vaporous bath, wash out the fæces, dilute what is absorbed by the venal orifices, and resolve the concremented humours by the saponaceous virtue which resides in sugar or honey; and thus by all these powers conspiring together, they allay too great motion of the humours, and that so effectually that Sydenham cautions physicians against the abuse of them, lest being unacquainted with their efficacy they should too much depress the febrile motion; whence sometimes arise very irregular symptoms and new disturbances, when the disease which was judged subdued is kindled again and creates great difficulties. Various forms of clysters may be seen in the materia medica of our author corresponding to the number of the present aphorism; to most of which nitre is added on account of the singular cooling virtue which it has.

Mild, watery, glutinous, and cooling medicines.] When the fever was reduced to its proper degree of force by the preceding remedies, Sydenham[†] gave no other medicines, unless he was forced to give something by the importunity of the patient.

B b 2

or

^{*} Lib. II. cap. 11. pag. 85. [†] Sect. I. cap. 4. pag. 75.

or his attendants, which he took care should be such as would not disturb the moderate force of the fever then present. But in the mean time while the preceding remedies are acting, it will be convenient to give such internal medicines as conduce to the same end. How useful the drinking of water is in this case has been lately observed; but water alone easily escapes and runs through the body either by urine or sweat, more especially when there is an inflammatory lentor in the blood. Such things therefore will be useful as communicate a slight degree of tenacity to the water, that it may better adhere to and be confined within the parts, so as to more effectually moisten them which are too much parched by the febrile heat: hence decoctions of oats, barley and the like, with the addition of honey, sugar and nitre, are of the greatest use: and although decoctions of hartshorn, ivory, and the like parts of animals communicate almost the same tenacity to water, yet they are less commendable for this purpose, because they too much incline to putrefaction, which is always to be feared in a violent fever. But all these last mentioned or internal medicines do in effect cool at the same time, because they relax the vessels, dilute the humours, dissolve concretions and sheath all acrimony; and thus they lessen the too great attrition betwixt the vessels and their humours, weaken the irritating stimuli, and that way remove the causes of too great heat.

With anodynes and opiates.] All the fore-mentioned remedies being first used, if the too great violence of the fever does not yet subside, a recourse may be safely had to these last. But in the beginnings of acute fevers these medicines ought not to be used, because alone they are not able to mitigate the fever, although they are given
in

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in a large dose, and Sydenham² has sometimes remarked the use of them to be mischievous. He observes that a phrenzy in an acute continual fever happily yielded to these medicines after the twelfth day of the disease; but that if they were given sooner they never proved useful. But how great efficacy these medicines have in restraining the too great violence of the fever, if they are given at a convenient time, is evident more especially in the cure of the small-pox. For, as we shall declare more at large hereafter when we come to treat of that disease, Sydenham confesses that he was not able to moderate the raging force of the fever by any other medicine than liquid laudanum, and that given every eight hours, if the violence of the disease seemed to require it. Whenever he gave a purge or a vomit in fevers, he always ordered an opiate in the evening to quiet the tumult which they raised; and by this method he used these evacuations with safety, which could not have been done without. See likewise what has been said of opiates in the commentaries to § 202, 229. N^o. 2. Hitherto may be likewise referred those comments which were given under the head of diseases arising from an excess of the circulatory motion.

S E C T. DCXI.

IF the febrile motion be found too low or dull, it may be raised by the use of cordials taken as food, by stronger drinks, by an air a little warmer, by raising more the passions of the mind, and by the use of more acrid, volatile, aromatic and ferment-

B b 3. ed

² Ibid. pag. 81, 82.

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ed medicines with frictions, heat, muscular
motion, warm baths and fomentations.

But when the force of the fever appears too weak or low, so as to be unable to subdue, move, separate and expel the material cause, then there is occasion for such remedies as may excite or raise the too weak motion, so far as to enable it to produce the forementioned effects; yet with such moderation that the humours may not be dissipated by too much increasing their motion, nor the tender solids destroyed.

But as the heart is the principal cause of all those motions from whence the vital powers are estimated, therefore those remedies which serve to increase the motions are termed cardiacs, although they are not immediately subservient to the heart only; nor is the term cardiac always used in such a sense by the antients; since by this name they often call such patients as have a disorder in the stomach^a, and especially in its upper orifice, which they denominate *cardia*, (see the comment to § 63.) and therefore the remedies proper to this disease may be allowed the denomination of cardiacs. But at present it has been customary among us to denominate such remedies cardiacs as recruit the vital powers, and therefore increase the too weak motion of them through the vessels.

But cardiacs are such as either increase the quantity of good juices in the body, or such as render the action of the moving causes more powerful; and such are chiefly the following.

By the stronger meats and drinks.] For here every thing is required which is perfectly opposite
to

^a Alex. Trallian. Lib. VII. cap. 9. pag. 341. Cælius Aurelian. Acutor, Lib. II. cap. 30.

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to those mentioned before in the preceding aphorism, in which it is said that the force of the fever might be best allayed when too violent by abstinence, a thin diet and drinking of water. When therefore this motion being too languid requires to be raised, stronger foods and drinks will be of service. But the strength of food is measured partly by the quantity of nourishment which it has, and partly from the greater or less cohesion of its parts which resist the digestive powers. But it has been often observed before, that the motion of the humours may be increased and a fever raised even in healthy people from taking great quantities of food, especially such as is of difficult digestion; hence therefore the same consequence may be justly expected in patients in whom the powers, being weakened by disease, are less able to digest and change the aliments. Hence appears the reason why Hippocrates says (see § 602, N°. 5.) *Imbecilles diætæ frigidæ, valentes vero calidæ*. "That weak patients should be supplied with a diet of cooling food, but the strong with heating food." But it is sufficiently evident that care should be taken to avoid giving such food, as being incapable of digestion in a weak body would spontaneously tend to corrupt. Therefore flesh broths seasoned with agreeable spices, custard or eggs dressed in a form capable of being supped, &c. will answer this intention; but a severe abstinence from all these was enjoined by Sydenham to his patients, so long as any danger was threatened from too great a motion of the fever either present or future. But among all cordials which increase the motion of the humours, wine bears the preference, which by its agreeable nature and friendly stimulus raises the languishing powers, and increases the too slow motion of the humours.

The like effect may be likewise had from strong ale, more especially when it has been rendered fragrant and spirituous by a due fermentation. But all these ought to be administered in small quantities and by degrees, lest a sudden alteration should happen towards the opposite extreme; and a careful attendance must be given to the effects following from the use of these, that from thence one may be able to determine whether the quantity of them ought to be increased or not.

An air which is a little warm.] How much the heat of the air in which the patient resides, may conduce to increase the force of the fever, we have already seen in the preceding aphorism; and it was there likewise remarked that without a due coolness of the air bleeding, clysters, and the other endeavours of art would be of little efficacy towards quieting the too exorbitant force of the fever. It is therefore sufficiently evident that too low a fever may be raised by a hotter air.

By raising more the passions of the mind.] How much the passions of the mind may conduce to increase the quickness of the circulation was said before in the comment to § 99. But since by the most intense passions of the mind very sudden and violent alterations may happen in the body, therefore the greatest prudence is here necessary to prevent the rise of such disturbances as would be afterwards very difficult to allay. Although anger is therefore able in the weakest person to excite a heat and an increased motion of the humours, yet this passion can hardly be convenient here, or at least it will be required only to be of a slight and short duration; but moderate joy and the hopes of an approaching cure with desire are here the chief and safest incentives, as they generally increase the motion of the humours, and do
not

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not in the mean time disturb the mind. When Galen^b remarked the alteration of the pulse arising from passions of the mind, he observed; *Iræ altus est pulsus, magnus, vehemens, celer, & densus. Lætitie magnus & rarus.* "That in anger the pulse is high, large, strong, quick and hard or resisting; but that in joy it is large and slow, &c." But we seldom want so violent an increase of the febrile motion as may be raised by anger, and which often cannot be excited without danger; but generally a moderate passion of joy will suffice.

By the use of more acrid, volatile, aromatic and fermented medicines.] It is the property of all spices when taken into the body to irritate the moving fibres and vessels by their stimulus, and by that means to increase the action of the vessels upon their contained fluids, in consequence of which follows a quicker circulation of the humours through the vessels. By an imprudent use of these a fever may be raised even in a healthy body, as we have already seen in the comment to § 586. N°. 1. and therefore the same effect may be much more expected when there is a febrile disposition already present, but too languid; but here more especially such things will be useful as have a volatile fragrantcy, and are disposed by the heat of the body to be diffused every way throughout; for those which have a very fixed acrimony not easy to be dissipated, such as pepper for example, are less safe to be used, because they often continue their action too long, and too much increase the violence of the fever, which is always more dangerous than a weakness of it. For if the fever is too low, there is danger of a lasting weakness and
chronical

^b De pulsibus ad Tyrone's cap. 12. Charter. Tom. VIII. pag. 8.

chronical diseases, which yet are often curable : but when the fever rages with too great violence, it often causes sudden death by destroying the most tender vessels ; or by too much inspissating the fluids such disorders arise as cannot be afterwards removed by any art. Hence therefore, though the whole cure hinges upon a due moderation in the course of a fever, yet we ought rather to govern its impetus so as to make it less than greater than it should be ; because thus there will be less danger, and the slighter error in this respect may be more easily corrected. For this reason scordium, balm, rue, citron peels and the like, are in this case preferable to more acrid medicines ; and hence we generally abstain from the strongest of these medicines, unless the patient be from his natural habit and age inclined to coldness. But all these stimulating medicines are never to be used in the beginning, but only towards the end, when the force of the fever is declining, and then they have often very happy effects. Hence Sydenham^c in treating of the cure of continual fevers says, *Cum autem finem spectat, atque declinationem, secretionem jam conspicua, tunc quidem calidioribus medicamentis illam a tergo insequemur, ad rem eò celerius ac certius perficiendam :* “ But when the “ fever approaches towards its declination and “ end, a separation of the matter beginning to appear, then indeed we may follow it closely with “ the warmer medicines to accomplish the end “ sooner and more effectually :” and he also observes, that if cordials are necessary in the beginning of the disease, only the milder kind of them ought to be used, gradually proceeding to such as are warmer, according to the progress of the
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^c Sect. I. cap. 4. pag. 72, &c.

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the disease or degree of intensity in the febrile motion; but affirms that he had observed less danger from the use of the stronger cordials, if the patient had been first weakened by a plentiful blood-letting, or by old age, than if the patient was in the flower of his age and no evacuation preceded. For in young people, as he well expresses^d it, *Domi nascuntur cardiaca; & quæ foris adduntur, aut frustranea sunt, aut etiam damnosa.* "They have cordials in themselves; and those which are added externally are either useless or pernicious:" But on the twelfth day of a continual fever which usually terminates in fourteen days, he indulged the use of the warmer cordials, being certain that by this means he accelerated the concoction of the febrile matter.

Now the number of cordials both simple and compound is very great; many of which stand ready prepared in the shops, and of which a large catalogue may be seen at § 1112. in the Institutes of our celebrated author^e, from whence prescriptions may be formed of various kinds according to the different age, sex, temperature, stage, and continuance of the disease, season of the year, &c. But several specimens of such forms of medicines may be seen in our author's *Materia Medica* at the number corresponding to the present aphorism. A moderate use of wine has the most happy effects in these cases; and this only is preferred to other cordials in the cure of the small pox to excite the languishing powers, as we shall declare hereafter.

With frictions.] From what was said in the comment to § 28. N°. 2. and § 606. concerning frictions,

^d Sect. I. cap. 4. pag. 71, &c. ^e Institut. Med. H. Boerh. § 1112.

frictions, it is evident that by this means the motion of the humours may be accelerated through the vessels to any degree, either throughout the whole body or any particular part. It was also observed from Celsus, that frictions were not useful while the disease was in its increase, but only in the decline. But as it had been a maxim with many physicians, that all helps are necessary in the increase of diseases, and not when they are terminating of themselves, therefore Celsus very well adds^f : *Potest enim morbus, etiam qui per se finem habiturus est, citius tamen adhibito auxilio tolli; quod duabus de causis, necessarium est: Et ut quam primum bona valetudo contingat, Et ne morbus, qui remanet, iterum quamvis levi de causa exasperaretur.* " That a disease which is about to terminate of itself may yet be brought to a period sooner by the use of proper helps, which are therefore necessary upon two accounts; namely, that a good state of health may be restored as soon as possible, and to prevent the disease not thoroughly removed from breaking out again and becoming worse even upon a slight occasion." But he advises frictions to be used for removing the remains of diseases; and which are serviceable, inasmuch as they make a salutary increase of the circulating motion of the humours towards the end of diseases, and also because they serve to open the emunctories (see § 606.) through which the matter of the disease being rendered pervious and moveable, ought to be secreted and expelled.

By Heat.] Concerning this we treated but a little before.

By muscular motion.] For when the muscles act, the incumbent veins are sooner emptied, and by

^f Lib. II. cap. 14. pag. 89.

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by that means the venal blood is more swiftly moved towards the heart, which therefore contracting itself quicker excites a fever when there is none, or increases it when present. But this remedy is seldom used, because the patient being weakened is indisposed for exercise or muscular motion.

By warm baths and fomentations.] Moist warm bathing and fomenting rather weaken and lessen the force of the fever by relaxing the vessels, as they apply warm watery vapours to the surface of the body. But a greater heat being thus raised in the blood, and especially if they are composed of aromatic infusions or decoctions, they may by a stimulus increase the motion of the humours; besides which, there is also dry bathing, which acts by the heat of the ambient air increased without moisture; and there are also fomentations of the like kind which produce their effects almost only by heat. Celsus also recommends for the same uses, *Milium, sal, arena, calefacta & in linteum coniecta, etiam solum linteum, si minore vi opus est: calido oleo repleti utriculi, vasa fictilia aqua calida repleta, &c.*^s “Millet, salt, sand, &c. heated and
“applied in a linen cloth, as also linen clothes
“only, if there is occasion for less warmth; like-
“wise bladders filled with warm oil, earthen vessels
“filled full of warm water, &c.” But when every thing is in too languid a condition by depressing the force of the fever too much with the use of coolers too long continued, and especially in people far advanced in years so as to prolong a fever beyond forty days, which usually terminates otherwise in the space of a fortnight; and if cordials and strengthening remedies have been administered

^s Lib. II. cap. 17. pag. 95.

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nistered without effect, the fever remaining obstinate to all these means, or if there seems to be an intermission of the febrile heat, the powers remaining greatly weakened; in that case Sydenham^a has observed the application of the heat only of strong young people of the greatest use to such patients; for only by that remedy the weakened powers are so much recruited as to free the body from the matter which remained to be discerned and discharged to restore health. Nor can these effects be ascribed only to heat in this case, because Sydenham had experienced that the application of warm linen clothes, though often repeated, never produced the like salutary effects. For the most subtle part of the humours exhaling from a healthy young body, are thus plentifully derived into the patient weakened from a deficiency of the most subtle and elaborated fluids, when at the same time a moderate warmth and moisture is equably and continually applied to the languishing parts not strong enough in themselves to maintain a due warmth. But concerning the happy use of this remedy in the weakest people, we treated before on another occasion in the comment to § 101.

^a Sect. I. cap. 4. pag. 79.

S E C T. DCXII.

AFTER the first remedy (§ 609.) which removes the viscidities, the next is to restore the elasticity of the vessels, by lessening the quantity of their humours, by a copious and free blood-letting from a large orifice; and afterwards, or at the same time, increasing its motion by stimulating remedies.

Our blood, even in a healthy state, is so strongly inclined to a concretion, that it immediately congeals as soon as it has acquired a state of rest out of the vessels; but the rapid motion of the blood through the vessels, and the continual change in the situation of its particles drove through the converging vessels, and by that means continually striking against the sides of the canals, are the causes which hinder the particles of the blood from continuing one moment in the same contact, and which therefore prevent them from concreting and uniting together into a solid mass. But there are two distinct causes acting alternately, whereby our humours are propelled through the arteries, namely, the contraction of the heart filling the arteries, and the contraction of the arteries themselves the moment after they are distended, propelling the blood through the ultimate and smallest ends of the arteries into the veins. But the action of the arteries urging forward the blood, proceeds from a contraction, wherein the fibres distended (with the blood, impelled by the force of the heart) into a greater arch, shorten themselves by their own elasticity when the distending cause ceases, and disposing

posing themselves in right lines, approach nearer the axis of the vessel, so as to diminish its cavity and propel forward the contained humour. But if there is so great a plenitude in the veins that they cannot most commodiously receive the blood impelled from the arteries, then the fibres of the arteries over-stretched by the distending blood cannot shorten themselves, but continue strained, whence the strength of the fibres will be weakened, as we demonstrated before in the comment to § 25, N°. 3. But a weakening of the strength of the fibres will also lessen their elasticity (see § 30.) The same thing will be also true, if the humours meet with a difficult passage through the ends of the arteries, whether from a fault in the humours to be transmitted, in the vessels themselves, or in both together.

But how great a power the force of the vessels has in dissolving the concreted particles of the blood, and in pressing forward the contained fluid by lessening their cavity, is more especially evident from the elegant observation of Lewenhoeck, mentioned before in the comment to § 131. For he saw a particle of concreted blood filling the whole cavity of a small artery in the wing of a bat, which was at one time protruded forward in the artery, and soon after again repelled back by the contraction of the artery, because it was not small enough to pass through its converging extremity; and thus at length the concreted mass by frequent attrition and returns, was so dissolved as to pass through the ultimate extremity of the artery into the vein.

But the elasticity of the fibres over-stretched cannot be restored but by removing the distending cause. But this may be done best by a copious and quick bleeding from a large orifice in a vein,
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concerning the efficacy of which see what has been said in the commentary to § 133, N^o. 1. where we treated on the cure of obstructions so far as it depends upon the remedies which restore the reciprocal motion of the vessels. Moreover, when an impervious fluid stagnates, impacted into the narrow extremity of a small artery, it may by the contraction of the artery be pressed back towards its larger capacity, unless hindered by the force and quantity of the humours urging behind: but by a copious and swift bleeding from a large orifice, the quantity and impetus of the blood is considerably lessened, and therefore such an evacuation may be extremely useful in this respect. See what has been said in the comment to § 141, where we treated more at large concerning this effect of blood-letting.

After the vessels are thus depleted, it will be convenient to administer such remedies as by a gentle stimulus increase the circulation, that the viscosity in the humours may be attenuated by the repeated action of the vessels. For the vessels being too much distended, may lose so much of their force as to be scarce any longer able to exert their action. Thus the bladder becomes paralytic by retaining the urine too long, and loses all its contractile force. But by these stimulants the vessels are excited into stronger and more frequent contractions. See what has been said upon this subject in the comment to § 133, N^o. 4. Nor is there any great danger of too much increasing the circulation by the use of stimulants, when a plentiful blood-letting has been premised, because all prudent physicians refrain from the use of the more sharp and heating stimulants in such a case, wherein the milder kinds can never do any harm. Hence Sydenham^t

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^t Sect. I. cap. 4. pag. 73.

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advises physicians to be always mindful, that even the stronger cordials may be given with safety in acute diseases, if a plentiful bleeding has been premised. Nor is this a wrong step in art, as some have rashly believed; namely, in weakening the patient first by bleeding, and then by endeavouring to increase the blood's motion by stimulants, which was violent enough even before this evacuation. For by a copious and quick bleeding the impervious viscid matter may be derived by a retrograde motion into the larger vessels, so as to set the obstructed parts at liberty: and this being done, the humours may be more safely put into a greater motion through the vessels, which could not be done without injury before the obstacles were removed.

S E C T. DCXIII.

THIRDLY, the same viscid matter is rendered fluid by diluting with watery drinks, baths, fomentations, and clysters, and with frictions at the same time.

If water can interpose itself betwixt the particles of the blood too strongly cohering, its cohesion will be dissolved, and the viscosity will be lessened or entirely removed. This is what we call diluting, and with respect to our humours almost the only diluent is water, concerning the efficacy of which in this case see what has been said in the comment to § 134 and 135, N°. 1. But water and such remedies wherein water abounds, may be applied to the body, and mixed with our humours in all the forms mentioned in the present aphorism; and the action of it may also be determined at pleasure towards any par-

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particular part of the body, if that is required by a topical disorder: but this determination of the diluent water may be obtained by such medicines as derive, attract, and propel, as we have demonstrated in the several places before cited. But when the diluent water is once mixed with the blood, frictions are a capital remedy; for by this means, the matter contained in the vessels is put into motion, and ground together with what ought to be dissolved by the diluting power of the water. The motion of the humours may be likewise increased by frictions, either throughout the whole, or some particular part of the body, as we said before at § 611. See also what has been said concerning the efficacy of frictions in removing obstructions in the comment to § 133, N^o. 3.

S E C T. DCXIV.

THE last-mentioned remedies will better accomplish their action, if assisted by drinking of saline waters and liquors made hot, with the aromatic, bitter, and lactescent juices of plants drank cold.

The febrile viscid is often of such a nature that water can either not at all, or else very difficultly insinuate itself betwixt the cohering particles. The truth of this sometimes appears with a very bad presage in acute inflammatory diseases, where diluents drank even in a large quantity, and applied to the body in the form of a clyster, bath, fomentation, &c. prove of no service; but all the ingested water runs out from the body, either by the passages of the urine or sweat, leaving the same inflammatory tenacity still remaining. There is therefore fre-

quently occasion for other helps, which being mixed with the water, may by their attenuating force fuse and divide the viscid matter, and by that means procure a passage to the water, that it may interpose itself betwixt the now separated particles that they may not easily unite again. For this reason, in the cure of obstructions arising from the cohesion of the particles together in the fluids, such things as attenuate were also recommended, besides those which dilute (see § 135); and more especially among these, salts and soaps are useful in this case. But among the salts, nitre, sal prunel, sal polychrest, and the like, prepared of nitre, are recommended before the rest, because it is almost the lightest among salts, is alterable by the powers of the body, and cooling without too much increasing the motion of the humours by its stimulus, and at the same time it most effectually resists all putrefaction, which is much to be feared in fevers from the increased motion of the circulation. But among the soaps, the native are preferred, such as honey, sugar, the fresh expressed juices of ripe garden fruits, syrups, inspissated juices and jellies, &c. prepared of these, and kept ready for sale in the shops of confectioners. But decoctions of the bitter and most of the lactescent herbs are especially recommended for this purpose, as they are enumerated in the *Materia Medica*, at the number corresponding to that of the present aphorism; and which are said to be cooling, because they never increase heat, even though they are endowed with a great dissolving power, and are taken in large quantities. In all these plants there is a gentle bitterness, and upon wounding them they yield a milky juice of a mild, bitterish and aromatic taste, which juice abounds with a dissolving power, beyond almost every other known remedy, and has the

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the advantage of exciting no disturbance in the body during its action; and hence it is that these plants are useful both in acute and chronical diseases. Thus the very malignant atrabiliary viscid is never more safely nor more happily dissolved than by a long continued use of these plants. At the same time there seems also to be a gentle anodyne power in these plants, but such as is always safe and never offensive, even though they are used in a greater quantity. All this may be more especially affirmed of lettuce, which Galen^k always esteemed at a high rate, because in his youth, when his stomach was continually infested with bile, he found relief from lettuce; and when he grew into years, lettuce was his only remedy against watchfulness, to compose him to sleep. Of these plants, or in the winter-time of the roots of vipers-grass, fuccory, goats-beard, &c. which are usually kept in the shops covered over with sand, decoctions may be prepared, and used with great success: but for these to exert their efficacy, it is necessary for them to be taken in large quantities, as no injury can be feared from taking them in such a manner. About half a pound of these roots, for example, being beat in a mortar, boiled in two or three pints of water and strongly expressed, gives a decoction, which being sweetened with honey, syrups, &c. with the addition of a dram or two of nitre, affords a most efficacious remedy in this case.

But all these liquors ought to be drank hot, since by cold the particles of the blood concrete together, (see § 117.) and the vessels are constricted so as to give birth to obstructions (see § 108); or at least so as to increase the present obstruction.

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^k Lib. II. de Alimentor. facult. cap. 40. Charter. Tom. VI. pag. 359.

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Besides this, the dissolving power of water is increased by heat and lessened by cold; for the brine of sea-salt, for example, which is made as strong as possible in the summer-time, crystallizes or deposits some of its salts when the weather grows colder, and deposits almost all its salt when it begins to freeze. But the heat in which these liquors are best drank, should but little exceed that of the healthy body; for if it is increased beyond this, it may occasion the blood and its serum to concrete or harden (see § 117).

S E C T. DCXV.

WHICH remedies (§ 613, 614.) that they may act well, quickly, safely, and powerfully, ought first to have blood-letting premised, because that makes way for their entrance into the blood, and forwards their due mixture and action.

In what manner the too great force of a fever may be moderated by bleeding, we have already seen in the comment to § 610, and it was likewise demonstrated at § 612, that by the same means the elastic force of the vessels is best restored when they are weakened by too great a distention from the oppressing fluid. But also the efficacy of diluent and attenuating remedies is promoted by taking blood from a vein. For thus the thickest, namely the red part of the blood, is more especially exhausted from the body; and as every thing taken internally or applied externally, is received first by the veins only, therefore these being in some measure emptied by bleeding, will give an easier entrance to these remedies for them to mix with the blood.

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blood. Besides this, so long as the impervious viscid matter continues impacted in the smallest extremities of the arteries, though the most powerfully dissolving medicines are given in the largest quantity, yet they cannot reach to the affected part, but at most, can only pass together with the humour urging behind, so as to touch gently the extremity of the obstructing mass, and can therefore exert little or no power towards dissolving the same. But when by a copious bleeding in a full stream from a large orifice, the impulse of the humours behind the obstructing matter is lessened, and the same matter repelled back by the contractile force of the arteries towards the larger capacity of the vessel, or into larger branches, so as to flow with the rest of the blood; then these dissolvents mixing with the blood, and ground together as it were with the viscid matter by the force of the vessels, exert their powers with the greatest efficacy. It is therefore evident, that blood-letting procures an easy entrance to these remedies, a ready mixture of them with the matter which ought to be attenuated and dissolved by their power, and likewise that it renders their action safe and effectual.

S E C T. DCXVI.

WHEN once the viscid matter is dissolved by the fore-mentioned remedies, (§ 609 to 615.) it may be drove forward and expelled by a continuance, or a more plentiful use of the same : but frequently the matter being thus corrected will have no occasion to be expelled (§ 95).

When the viscid matter has been so dissolved as to be able to flow through the vessels together with the rest of the humours by the use of the several remedies before-mentioned in the paragraphs cited in the present aphorism, then the physician ought to enquire whether the several functions return to their due integrity, and whether at the same time the whole force of the fever is allayed, or whether any new symptoms arise, because the morbid matter, though dissolved and rendered moveable by a due moderation of the fever and efficacy of remedies, as yet retains such properties as render it repugnant to an equal circulation (see § 594, N^o. 2); for then this matter ought to be expelled from the body to restore health. But it is not safe to attempt the discharge of it immediately by profuse evacuations; but prudence directs to enquire by a diligent observation towards what part and by what passages nature inclines to evacuate the febrile matter from the body, after it has been resolved and rendered moveable; for when this is known, we then direct the dissolved matter of the disease by lubricating the passages, and urging it forwards by gentle stimulants towards the part to which nature directs. Hence it is evident, that all the fore-mentioned remedies may be

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still

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still continued, and even the strength and quantity of them increased to advantage, because the obstructions being now resolved, the free motion of the humours through the vessels is restored. At the same time also the action of all these remedies may be principally determined towards the affected part by warm bathing, fomentations, frictions, &c. applied to the part where we know by the signs before described (§ 594, N^o. 2.) that nature endeavours to procure a discharge to the morbid matter.

Sometimes indeed the viscid matter dissolved by the forementioned remedies is so conditioned, that it is capable of being assimilated with the rest of the healthy humours, and of circulating freely together with them through the vessels without any impediment to the functions. In this case it is very apparent that there is not the least necessity to expel what is dissolved. As for example, if the red globules of the blood which are only capable of passing through the smallest extremities of the sanguiferous arteries by one at a time, should concrete together so as to stick fast in them and occasion disease; in that case a perfect cure may be obtained without any evacuation of the obstructing matter, if by bleeding the impulse of the humours urging behind is so much abated that the obstructing particles are repelled back into the larger branches by the contraction of the vessels; and afterwards the concremented globules may be resolved into their smaller elements, by the conjunction of which they were made up, the dissolution being effected by the attrition of the vessels and the adjacent parts of the fluid with the diluents, attenuants, &c. See what has been said upon this subject in the comment to § 595.

S E C T. DCXVII.

TH E symptoms arising from a particular acute fever are chiefly the following; coldness, trembling, anxiety or oppression, thirst, sickness at stomach, belchings, vomiting, weakness, heat, burning, dryness of the skin and mouth, delirium, coma or sleepiness, over wakefulness, convulsions, sweats, or diarrhæa, and inflammatory pustules or eruptions.

We have already considered in order the three primary indications which are required for a general cure of fevers (see § 598.) It now follows therefore for us to treat of the cure of particular febrile symptoms. The symptom of a fever (as was observed at § 11 and 598.) is that preternatural change or appearance which happens in the body of the patient from the disease as the cause, yet so as to be distinguishable from the disease itself and its proximate cause. But it is thus denominated, as if it were a concomitant accident; because, for any disorder to be called a symptom of a disease, it ought to be present during the time of the disease, from whence it proceeds as an effect or consequence. Thus for example, when a quartan terminates in a dropsy, the dropsy is not said to be a symptom of the quartan, although it was an effect of it, because it does not coincide with the quartan itself, but follows after it. For it was demonstrated before (§ 593.) that fevers terminate in other diseases; yet the diseases in which the fever terminates cannot be reckoned among its symptoms.

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Moreover, it is possible for a new disease to arise in the body at the same time when the fever is present, though it neither proceeds from the fever nor its proximate cause, but arises from a very different spring; as when, for example, a febrile patient is wounded or put into a violent passion, &c. All these are not called the symptoms of a fever, but supervening accidents (*ἐπιγεγόμενα*¹) because they indeed arose during the time of the fever, but did not arise from thence as their cause. We are here therefore to treat only of the symptoms of fevers properly so called, of which the principal and most obvious are enumerated in this aphorism, and concerning each of which we shall speak more at large hereafter, by considering each of them under a distinct head, in the order wherein they are here enumerated.

S E C T. DCXVIII.

ALL which symptoms (§ 617.) arising from the fever as their cause (§ 581, 587.) will consequently cease, when the fever is removed; and therefore if they can be supported so long without endangering the patient's life, they will hardly require a particular treatment.

Since therefore the symptoms of a fever properly so called acknowledge the fever for their cause, it is evident that the fever being cured they will be removed, and therefore they do not always require a particular treatment. The first enquiry must be then, whether the symptoms arising from the fever be such as will give just reason to apprehend danger;

¹ H. Boerh. Instit. § 801.

ger ; for if they do not appear to be of such a nature, they need not be regarded, and there will be no necessity to alter the general curative indication, which may be sufficient to terminate the fever without making any new addition to it : since the same treatment which is able to cure the fever, will likewise suffice to conquer the symptoms. Thus the sickness at stomach and vomitings, which accompany an ephemera or fever of one day's continuance, may be safely neglected ; and yet the same symptoms in an acute continual fever often require a particular treatment, as will be made evident hereafter. It has been many times an obstacle to the cure of the disease, because the physician has immediately departed from his general indication, on account of the appearance of some new symptom ; and that frequently when the symptom is slight, and generally goes off on its own accord. Hence Hippocrates justly observes, *Non secundum rationem levantibus fidere non oportet, neque valde timere mala præter rationem orta. Multa enim illorum incerta sunt, neque multum perdurare, neque diutius morari consueverunt.* “ That we ought not to
 “ trust those changes which relieve the disease
 “ without any reason, nor yet to fear much the
 “ ill accidents which arise without any cause or
 “ reason : for many of them are uncertain, short-
 “ lived, and seldom have any long continu-
 “ ance ^m.”

^m Aphor. 27. Sect. II. Charter. Tom. IX. pag. 69.

S E C T. DCXIX.

BUT frequently these symptoms (§ 617.) arise from the *vis vitæ*, or effort of life, disposing itself to a crisis, or to make a discharge of the critical matter; and when they precede, accompany or follow this crisis or excretion, they ought not to be disturbed.

In treating of a crisis in the comment to § 587. it was made evident that wonderful disturbances, or new and often violent symptoms were excited at the time, when the remaining health in the patient seems to encounter with the disease nearly with equal disadvantage on both sides. But even after the morbid matter has been subdued, and rendered moveable, so as to flow through the vessels with the rest of the humours, there are often raised anxieties, wandering pains, sickness at stomach, tremblings, cold shiverings, &c. and very often the like symptoms accompany even the salutary evacuations of the same matter. But from all that has been hitherto said concerning the cure of fevers, it is evident enough how badly the physician consults the interest of his patients, who, being affrighted at these disturbances and salutary efforts of nature, endeavours to allay them unseasonably by remedies. Therefore, before the cure of any febrile symptoms is attempted, it ought to be first carefully enquired, whether they are to be ascribed to the disease itself increasing, or to nature encountering the disease. For most of the symptoms, concerning which we are here to treat, are usually observed either to precede, accompany, or even sometimes to follow after the crisis, or an evacuation of the critical matter,

ter, and then they ought neither to be disturbed nor removed ; but when they arise from the increase of the disease, they often require a separate treatment peculiar to themselves.

But the critical symptoms are distinguished from those of the disease, from their appearing after a previous concoction of the crude morbid matter, and about the time proper for a crisis in such diseases ; and it is also usual for them to go off in a little time by a sort of critical evacuation, or by a translation of the matter upon some other part, and they are likewise accompanied with signs denoting that the *vis vitæ* overpowers the disease. But the morbid symptoms happen throughout any time of the disease, and more especially during its increase ; and they arise from the force of the disease overpowering the vital faculty, while there are manifestly all the signs of crudity still attending ; nor do they alleviate the disease, but are always injurious, by disturbing many of the functions. But concerning the signs of concoction and crudity we treated before in the comment to § 587. It might be demonstrated by many instances how much the same symptoms differ among themselves, according to the different time of the disease in which they appear. Profuse sweats and great evacuations by stool are always of the most fatal consequence in the beginning of acute diseases, because they exhaust from the body the most fluid parts of the humours ; and yet how frequently are acute diseases happily cured by sweats and diarrhæas, when they happen after a preceding concoction, and when the matter of the disease being subdued and rendered moveable is discharged by those ways. In the first case these evacuations are to be restrained, but not at all in the last. A coldness of the extremities, when an ardent fever is in its increase or height, is
commonly

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commonly esteemed a fatal sign ; and yet in the same disease when declining, a sudden coldness often arises, and is attended with a violent shaking of the whole body, while the inflammatory lentor being dissolved gives the blood a free passage through the ultimate extremities of the arteries into the veins, which terminates the disease. The weakness perceived in the beginning of acute diseases is often removed by bleeding and other evacuations ; but when the same symptom happens towards the end of these diseases, it requires an opposite method of cure, namely, by filling with cordial nourishment. These few instances may suffice to demonstrate how much attention is here necessary to determine whether the symptoms appearing in fevers are of a good or bad presage, and whether they ought to be removed by art, or left to nature.

S E C T. DCXX.

BUT if these symptoms (§ 617.) come out of season, or are too violent or severe to be supported by the remaining life and patience in the sick, or if they threaten to produce some more grievous malady, then each of them are to be mitigated by their respective remedies, having always a regard to the causes (§ 586.) and to the stage of the disease itself (§ 590.)

We come now to consider what the signs are by which we know that the symptoms arising in fevers ought to be removed, and which denote that they cannot be safely neglected until they are cured together with the fever, from whence they derived their origin as the cause. The first of these is when
they

they appear out of season, that is to say, at a time of the disease when there have not yet appeared any signs of concoction, namely, in the increase of the disease: thus, for example, sweats or a diarrhæa ought to be restrained, if they arise in the beginning of acute diseases, as we observed before; not that these evacuations are always bad, but because they are almost constantly injurious in that stage of the disease.

Too violent or severe to be supported by the vital strength.] That is to say, when the symptoms denote such a part of the body is affected as cannot sustain much injury without endangering life; for then the symptom ought to be immediately relieved, although the original nature of the disease itself requires no such procedure. That when a phrenzy arises in a continual fever, Sydenham^a tells us that he indulged the use of blood-letting, clystering and cooling remedies more liberally than might otherwise seem to be safe. The vital strength was often so much weakened by these means, as to occasion the fever to run out to a longer extent, nor did the concoction and crisis of the febrile matter so happily succeed; but then the urgency of a symptom may require us to remove a greater evil by a less.

Or by the patience in the sick.] How useful a quiet sedate temper of mind is towards the cure of acute diseases no one can be ignorant; and we have even seen before that a fever may be raised by violent passions of the mind only. If therefore the patient is of such a disposition, that a slight pain, anxiety, &c. puts him into a great fright, or if he should be much enraged with anger, unless those passions are immediately quieted, we are often obliged to alleviate, or even to remove some of the symptoms

^a Sect. I. cap. 4. pag. 81.

symptoms which might otherwise have been better neglected according to the rules of art. Of this the physicians are too sensible, who attend at the courts of the great. Thus I remember to have seen a most impatient youth, who so badly supported the hot fit in a regular or vernal tertian, that he persisted to have the symptom removed by opening a vein *ad deliquium*. When the physician and his friends standing by, which last were also not unacquainted with physic, endeavoured to dissuade him from it, he was so enraged that he snatched up a penknife, and opened a vein himself not without danger; nor could he be restrained without violence from continuing to bleed in this manner to the quantity of several pounds. Now although this fever would have been cured of itself spontaneously in a little time, and was under no necessity for having a vein opened, yet it might be allowed in such a case to prevent the patient from hurting himself by such a rash attempt.

Or if they threaten to produce some more grievous malady.] It is well known that ardent fevers are sometimes very happily cured by a profuse bleeding at the nose supervening; and all prudent physicians never obstruct such an evacuation, unless it should prove so large as to endanger the patient's life. But if an artery breaking in the lungs, by the force and violence of the fever, should occasion a spitting of blood, it must be immediately relieved by opening a vein; not on account of any danger from the hæmorrhage in itself, but because there is danger, that if the spitting of blood be neglected, it cannot be afterwards suppressed; or lest it should degenerate into an ulcer of the lungs, and end in a consumption, as sometimes happens. Thus, for example, when the matter of the disease being dissolved and rendered moveable, is translated and de-

posited on the legs, we then forward the deposition on these parts by the application of cataplasms, fomentations, &c. but if the signs denote that the same matter tends towards the liver, lungs, brain, &c. we then endeavour to hinder it by all the assistance of art.

But in alleviating the symptoms of fevers, a regard must always be had to the causes from whence the fever itself arose; for unless this be attended to, the most fatal errors may be committed: Thus, for example, if the stagnating serum begins to putrefy in a dropical patient, a fever ensues, which is often attended with intolerable thirst: if now one endeavours to alleviate this troublesome symptom by a frequent use of watery drinks and clysters of the like nature, which always so happily allay febrile thirst in other cases (as will be declared more at large hereafter at § 640.) the patient would be much injured, and the stagnant water would be suddenly increased. When a delirium arises in fevers from exalted and corrupt bile lodged about the præcordia, as is frequently observed to happen, blood-letting though repeated is used without success; but if the foul humour is removed by a gentle vomit, or carried off with a gentle purgative by stool, this symptom is removed, and the fever itself at the same time alleviated. They who attempt to cure a mania or madness by evacuation, which sometimes happens in the beginning of stubborn intermittents, bring on an incurable foolishness upon the unhappy patient; and yet the same method succeeds very well in the other kinds of madness: whereas this kind of madness is happily cured by a restorative diet with corroborating cordial medicines, as Sydenham^o very well observes. What has been said might be proved by many more examples, but these may suffice;
from

^o Sect. I. cap. 5. pag. 123, 124.

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from whence it evidently appears, that a regard ought always to be had to the cause of the fever itself in alleviating or removing the febrile symptoms.

But what a great difference there may be required in the cure of the same symptoms, according as they appear in the beginning, increase, height, or declension of the disease, we may sufficiently demonstrate by one example. When a phrenzy has been raised in an acute fever by the use of heating medicines, Sydenham^p has observed, that bleeding and the use of clysters have been serviceable, till the violence of the disease has begun to decline; and then he has often been able to subdue both the disease and this symptom by narcotic medicines, given in a little larger dose than usual. But the same medicine given in the beginning, increase or height of the fever, has been so far from doing good, that it has often turned every thing for the worse; and therefore he observes, that in this fever, which usually terminated in the space of a fortnight, narcotics are never successfully given before the twelfth day.

It is not therefore sufficient, as some physicians imagine, immediately to attack the primary and most troublesome symptom of the fever, without having any regard to the cause or the stage of the fever itself: for it is evident, from what has been said before, that nothing safe or certain can be done in this respect, unless a diligent attendance be given to all these.

It now remains for us to describe the manner of alleviating and removing these primary symptoms of fevers, each under their distinct and respective heads or titles.

^p Sect. I. cap. 4. pag. 81, 82.

Of the cold Chill in Fevers.

S E C T. DCXXI.

Coldness in the beginning of acute fevers supposes a less attrition in the parts of the humours against each other, and against the vessels; a lessening of their circulatory motion, and a stagnation of the blood and humours in the extremities of the body, the heart then contracting itself less powerfully, emptying itself less perfectly, and receiving less spirits flowing into it from the cerebellum.

Cold with respect to us is nothing more than the sensation which is perceived in us by a diminution of the heat in the body; and therefore cold with regard to us is not a positive being, but only a diminution of heat. But thermometers teach us, that all bodies retain the heat of the ambient air, if no cause is applied, collecting a greater quantity of fire in them. In the same manner, all bodies hotter than the ambient air, are observed to return to the same temperature with the air itself, as soon as the cause exciting heat in them ceases to act: but the heat of the healthy human body is always greater than that of the air in which we live; and therefore so soon as the cause exciting heat in us ceases or is diminished, our heat lessens in proportion, and comes nearer to the degree of heat in the ambient air; and this diminution of heat is accompanied with that sensation which we call cold.

Since therefore in the beginning of fevers there is almost constantly perceived the sense of cold, it
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is evident that the causes generating heat in our body are at that time lessened. But the attrition of the humours against each other and against the vessels makes up the cause of heat in us; for this attrition being lessened the heat is lessened, and being increased the heat is also increased; but when it entirely ceases, as when a person dies, the dead body acquires or returns to the heat of the air itself in which it is contained. The truth of this doctrine will be demonstrated by more proofs hereafter, when we come to treat of the febrile heat; and at present it may suffice to produce only a few arguments which prove this. By violent motion, or exercise of body only, the quickness of the circulation of our humours may be increased, and therefore the attrition of the humours against the vessels becomes stronger and more frequent in a given time, and at the same time the heat is also increased, so that in the most severe winter's frost an animal exercised with swift running for a considerable time may acquire a most intense heat. But in those who have a less compact blood and more lax vessels, there is always perceived a greater coldness, because there is a weaker action of the vessels on the humours. This coldness therefore denotes a less attrition of the parts of the humours against each other, and against the vessels. But as this attrition depends on the circulating motion by which the humours are moved through the vessels, it is evident enough that the circulatory motion is lessened when this sense of coldness is perceived.

But when the circulating motion of the humours is lessened, the causes of that motion must be also diminished of necessity, which are the action of the heart by which the blood is drove into the arteries and distends them, and then the reaction of

the arteries, by which they contract their diameters while the heart is dilating, and by that means propel their contained blood through the extremities of the arteries into the veins. But when the efficacy of these two causes is diminished, the motion of the humours cannot extend to the extreme parts of the body, because they are most distant from the heart, which is the first cause of the motion in the humours; and then there are greater obstacles to this motion here than in other parts from the smallness of the vessels, which is still more increased by the cold itself, which contracts all solid bodies. Hence the reason is evident why the humours stagnate in the extreme parts of the body by this febrile cold.

But when the resistances about the extremities are increased, the humours there stagnating cannot overcome them by the moving powers, and therefore the heart will not be able to propel its contained blood into the arteries, because they are hardly any longer pervious at their extremities, and are now very much distended in their larger trunks; therefore the heart will be less able to empty itself, and consequently its contraction will be less, which in health entirely discharges all the blood contained in its cavities. Nor is it any objection to this that in a fever there is always a quicker contraction of the heart, (see § 573.) because at that time it is much weaker, and not able entirely to empty its cavities of their contained blood, as was demonstrated in the comment to § 576.

But as the heart is a muscle, it requires the common causes of motion necessary in the other muscles, namely an influx of the nervous spirits into the muscular fibres of the heart, and of arterial blood into the vessels which are distributed thro' its substance:

stance : and besides these there is another peculiar cause exciting motion in the heart, namely an influx of the venal blood into its cavities ; (see § 574.) and therefore one or more of these causes must be diminished when the heart begins to contract itself with a less force in the beginning of the febrile cold ; for although it may be easily conceived that the contraction of the heart must be lessened when the febrile cold is already present, and when all the humours begin to stagnate about the extremities of the arteries, because the force of the heart is not able to overcome the resistances, and therefore is not able entirely to empty itself, yet it does not so evidently appear what the cause is which lessens the heart's contraction at that instant of time when the febrile cold first begins to be perceived ; for this cold arises from a less attrition of the parts of the humours betwixt each other, and against the sides of the vessels, and consequently from a diminution of the circulatory motion, and therefore from a diminished contraction of the heart, which seems to be the first cause of the circulatory motion : therefore this coldness, as an effect, supposes the pre-existence of its cause. But the influx of the venal blood into the cavities of the heart will be rather increased by the febrile cold, contracting the external parts ; and the blood being drove into the emptied coronary arteries, while the heart is in its contraction by that whole force with which the aorta contracts itself near the heart ; therefore this cause of muscular motion in the heart not being lessened at that time, because the moving powers are increased, and the resistance in the empty coronary vessels themselves diminished, nothing remains but that the influx of the nervous spirits from the cerebellum into the fibres of the heart must be lessened at that time, from whatever cause that may

proceed. We know indeed from the most certain observations, that the motion of the heart has been wonderfully altered, and sometimes even totally abolished, so as to cause a true syncope, when the motion of the spirits has been disturbed only by a change of the thoughts in violent passions of the mind; and therefore it does not seem improbable that the same thing may happen in the beginning of the disease from the cause which excites the fever itself. However, it may be sufficient for the physician to know the changes which happen in the body during the time of the febrile cold, even though the primary cause thereof does not as yet appear very intelligible.

From all that has been said it is evident enough that this febrile cold is produced from the circulatory motion being lessened; nor is there any occasion for us to have recourse to cold effervescencies of the blood, or the mixture of salts, which produce a coldness while they are dissolving in liquors; because no such salts can be demonstrated present in the blood, nor no experiments can prove any such effervescence, mixture, &c. to take place during the time of the febrile chill.

Now all that is said in the present aphorism holds true in the cold chill which accompanies the beginning of fevers; but when a coldness arises in an ardent fever, which is about to go off critically, the case is different, as we shall declare hereafter in the history of that fever; for then the impervious matter, which hesitated about the extremities of the arteries, being dissolved, passes into the veins, whence soon after follows a very free course of the blood through the now pervious arteries into the almost empty veins: hence the attrition, which was before very great in the obstructed vessels, is suddenly diminished, whereupon a salutary cold chill arises,

SECT. 621, 622. Of Coldness in FEVERS. 409
arises, even though the heart's contraction is not diminished, and the humours do not stagnate at the extremities.

S E C T. DCXXII.

IF this cold chill continues intense for a considerable time, it occasions polypose concretions in the larger vessels near the heart, but in the smaller vessels it causes emptiness, by forcing them to press out the fluid they contain; and from hence follow many and great mischiefs both in the larger and smaller vessels.

If therefore the febrile cold continues violent for a long time, the venal blood, by the contraction and tremor of the parts which attends cold, and by the shaking of the muscles, will be derived towards the right ventricle of the heart: but the heart contracts and empties itself less at this time, as appeared under the preceding aphorism. Hence the venal blood will begin to be accumulated in the right auricle, venous sinus and trunk of the cava; where being collected it will almost stagnate, while only a small portion of this blood, and that the most fluid part of it, will be able to be transmitted through the lungs by the weak action of the heart; but from what was said in the comment to § 152. N^o. 2. it is evident, that such is the nature of the blood even in healthy people, that it immediately begins to concrete by rest, and separates afterwards into two parts, the one of which being thicker and solid, swims in the other part which is thinner; but that the vital motion only so intermixes these parts together, as to retain them in the state of fluidity.
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When therefore in the febrile cold long continued, the blood begins to stagnate in the auricles, sinus's, and large vessels near the heart, the particles of the blood begin to unite together, and separate from the thinner and serous parts, which are as yet able to pass through the lungs, whence the rest will be still more inclined to concretion, so as to form polypous masses, which being once concreted, and rendered firm by long continuance at rest, hardly ever after admit of being dissolved, but produce the most troublesome palpitations of the heart, with great oppressions or anxieties upon the least increase of motion or exercise of body, with faintings, and other most troublesome symptoms. But if the febrile cold is not of so long a duration, the fleecy and polypose concretions, which began to be formed in the blood, in the mean time being accumulated, more especially about the right ventricle of the heart, are afterwards dissolved and ground together by the febrile heat succeeding, with the increased force of the heart; and thus the parts which began to be concreted into a polypus may be dissolved again, as was said more at large in the comment to § 25. N°. 2. Hence the reason is evident why the lungs are found stuffed up with concreted and impervious blood in the dead bodies of those who die in the cold fit of an intermitting fever, as we shall declare hereafter at § 749.

But since strong powers of the heart are required to drive the blood through the ultimate extremities of the vessels, it is evident, that these powers being lessened, the circulation will become very difficult at that time through the smaller vessels; and therefore only the most fluid part of the blood will be able to pass through the lungs, while the rest stagnates behind. But the smaller vessels
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which receive the thinner, serous and lymphatic humours from the blood-vessels, cannot be filled when these last are obstructed; and because the humours move more slowly in these smaller vessels, as being furnished with weaker coats, and placed at a greater distance from the heart, thence a stagnation will follow. Moreover, these same smaller vessels being contracted by cold, propel their contained humours into the veins; or if an obstruction should arise about the extremities of those vessels, they repel back their contained humour with a retrograde motion into the larger vessels, while the force of the heart, being weakened in the meantime, urges them forward with little or no force behind: thus they will be emptied of their contained fluid; and if the sides of the smaller vessels remain thus collapsed for a considerable time, they may grow together so as to be never after pervious. But that there thus happens an emptiness in the smaller vessels, by expressing their contained humours, we are taught by those disorders which often accompany an intense febrile cold. For these patients are sometimes so stiff that they are scarce able to bend any one joint; but we know that the due flexibility of the parts of the body depends upon a free motion of the humours through the smaller vessels; for in new-born infants, who have all the vessels yet pervious, we observe the greatest flexibility and softness of the whole body and its several parts; but in decrepid old age, the major part of the smaller vessels being concreted and rendered impervious, we observe the greatest stiffness and inflexibility. Besides this, when the febrile cold is intense, and continued for a long time together, all those functions languish entirely, which depend on a free motion of the thinnest humours through the smallest vessels: for these unhappy
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patients commonly lie stupid and dull, and are sometimes known to be possessed with so great an insensibility as to burn their feet to the bones without any sense of pain, during the severity of the cold fit in a quartan.

If now these effects of the febrile cold are applied to several parts of the body, it is evident, that a great many of the functions may be thence disturbed, and that therefore many and grievous disorders are to be feared, partly from the concretion of the humours almost stagnant in the larger vessels, and partly from the emptiness of the smaller vessels; and that from thence frequently arise disorders afterwards incurable, if those colds continue severe for any considerable time.

S E C T. DCXXIII.

HENCE it is evident what is denoted and prefaged by this coldness, and why the fever is more dangerous as the cold fit in the beginning of it was more severe; for in the beginning of a pestilential fever, the cold fit is the most severe, and the heat is proportionably the greatest as the disease advances.

What is denoted?] Namely, that the vital powers are diminished, that the blood is accumulated, stagnant, and inclined to concretion in the vena cava, right venous sinus and auricle, only the most liquid part being capable of passing thro' the lungs, while the grosser parts hesitate in the narrow pulmonary arteries, whence little blood passes into the left ventricle of the heart, the power of whose contraction being lessened, the blood is more difficultly propelled by it through the smallest extremities of the aorta, to which add all the other consequences enumerated before at § 621.

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What is presaged?] If this coldness continues long, there is danger of the lungs being charged more and more with impervious blood, 'till at length all the course of the blood from the right ventricle of the heart through the lungs is intercepted, whence death follows after the most dreadful anguish. Moreover, all those ill consequences are to be feared, which were mentioned in the preceding aphorism. But when afterwards the blood is dissolved, which hesitated almost impervious in the small pulmonary arteries, it flows with a great velocity into the left ventricle of the heart, which being thereby irritated, contracts itself more powerfully; whence it drives the blood with a greater force through the aorta; hence the attrition of the humours against each other, and against the sides of the vessels, will be increased, and from thence follows heat. The blood then will now return thro' the veins to the right ventricle of the heart, with a swifter motion and a greater impetus, and will be more easily moved through the lungs now pervious; hence the circulation will become stronger, as the arterial blood will be more powerfully applied to the cerebellum, and will pass more swiftly through the coronary arteries in the substance of the heart itself: And thus all the causes which excite the heart to motion, will be increased, namely, the influx of spirits into its muscular fibres, and of blood into its vessels and cavities: (see § 574.) and therefore, after the most intense febrile cold, will follow either suffocation and death, or most intense heat.

Why the fever is more dangerous as the cold fit, &c.] For this coldness denotes a diminution of the circulation, and therefore the greater the coldness the less the circulation; and the less the circulation, the nearer the disease approaches

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to death, wherein the circulation wholly ceases. But if at length the vital powers overcome this coldness, being irritated by the same cause which produced the fever, they render the circulatory motion so violent or swift, and excite so strong a heat, that the worst consequences of every kind may be feared. For the very tender vessels of the encephalon and lungs cannot bear so great a force without the greatest danger; and the great heat following after the most intense cold, may dissipate the more fluid parts of the humours, and inspissate the rest, whence there is the greatest danger lest the humours, becoming impervious, should hesitate in the narrow extremities of the arteries, whence the worst inflammation and gangrenes might be justly feared from so violent an impulse of the humours urging behind the obstructions in such a fever. Moreover, we know from the intense cold in the beginning of acute fevers, that the febrile cause is very malignant, because it is able so suddenly to weaken the vital powers in a healthy person. No wonder therefore that the most severe cold being observed in the beginning of a pestilential fever, should be afterwards followed with the most extreme heat in the progress of the disease; namely, when a fever is kindled by the pestilential poison received into the body. For Sydenham^a has observed, that sometimes, in the beginning of a most fatal pestilence, people would drop down dead suddenly in the streets without any fever, red spots breaking out, as the messengers of present death. But when the plague is accompanied with a fever, we are assured, from the observations of physicians, that the patients have perceived the most intense cold, as if freezing water was poured over the whole body.

^a Sect. II. cap. 2. pag. 133.

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body. But how great a degree of heat follows this coldness, is evident from many parts of the body being burnt up to a crust, where the violence of the disease settles, almost as if it had been produced by actual fire. We also observed, upon another occasion (see the comment to § 85.), that the body of an infant dying of the plague continued hot even two days after.

S E C T. DCXXIV.

THIS coldness being attacked by any kind of remedy, which is powerfully stimulating, under whatever denomination, has often occasioned afterwards an incurable inflammation. Hence saline, acrid, aromatic and oily medicines, with blisters, and the like, are here to be condemned as pernicious.

Since it is evident, from what was said before, that during the time of the febrile cold the circulatory motion is diminished; that the humours stagnate in the extremities, and that the force of the heart is so much weakened, that it less contracts and empties itself than it ought, therefore many have been of opinion, that it is necessary at that time to administer cordials and other stimulating remedies, to accelerate the motion of the stagnant humours, and increase the powers of the heart. But during the time of the febrile cold, the venal blood stagnates, and is accumulated about the right side of the heart, while only its more fluid parts can be forced through the narrow
arteries

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arteries

arteries of the lungs, by the weaker action of the heart : If therefore the motion of the humours is increased at that time through the vessels, by stimulating remedies, before the humours are attenuated, and the vessels opened, the gross and impervious parts of the blood will be more forcibly wedged into the extremities of the pulmonary artery, whence all the bad symptoms will be increased. Besides this, when such warm stimulating medicines have been exhibited, they continue to act even when the febrile heat comes on, after the cold fit has been overcome ; and therefore they render the patient still hotter, even while he is burning with the febrile heat itself ; whence there may be danger of a most incurable inflammation afterwards. All such remedies are therefore pernicious under whatever title they are administered, because they urge the impervious humours towards the narrow extremities of the obstructed vessels during the febrile cold ; and when the obstructions are removed during the hot fit, they increase the quickness of the circulation, which is, of its own accord, about to acquire too great a velocity. I have known a fatal pleurisy raised in a young man afflicted with a vernal tertian, by endeavouring to remove the cold fit by a very warm medicine, namely, by giving five drops of the burning oil of cloves ground well with sugar, just before the approach of the fit.

S E C T. DCXXV.

BUT it is best cured by drinking warm water with a little wine, honey, and nitre; and also by warm bathing, a vaporous bath, fomenting and washing with a liquor of the same nature, to which add gentle frictions.

The best method of all for curing the febrile cold, consists in so attenuating and diluting those parts of the humours which hesitate and are impervious, that they may be able to pass thro' the too narrow vessels which are likewise relaxed by the same means so as to give them a passage; and when this is done, exciting the powers of the heart by a gentle stimulus can do no harm. Some diluent drink therefore made warm and mixed with honey and nitre, makes a capital remedy in this case: A little wine may be also added, or mild spices may be diluted in a great quantity of water; because thus the water, in itself too unactive, is rendered more capable of penetrating, while at the same time there is no danger of injury from the small quantity of so mild a stimulus, as is contained in so great a proportion of water. But all these drinks are to be taken in a small quantity at a time and often, as every half quarter of an hour, lest the sudden distension of the stomach should increase the anxiety or oppression which already attends in the febrile cold, or lest they should be thrown up by vomit. But these drinks being received into the veins are conveyed immediately to the right ventricle of the heart, where by di-

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luting and attenuating the stagnant blood, they render it more easily capable of passing through the lungs; and being afterwards more intimately mixed and moved together with the blood through the vessels, they happily dissolve and clear all obstructions; so as to be always useful and never injurious. Various forms of these medicines are given us in the *Materia Medica* of our author at the number corresponding to that of the present aphorism; from hence may be chose such as seem most agreeable with the age and temperature of the patient, with the cause of the disease, &c. At the same time it will be very useful to apply liquid remedies of the same nature in the form of bath, vapour, fomentation, &c. to the bibulous veins opening in the surface of the skin; for these being absorbed are likewise immediately conveyed to the right ventricle of the heart, where there is the greatest danger of a concretion, as is evident from what was said before.

While these are taking effect, the motion of the blood may be safely accelerated through the vessels by gentle frictions, because thus the humours being dissolved by these diluent and attenuating liquors will find a more easy passage. But more especially such frictions are to be applied to the extreme parts of the body, because there the cold is greatest, and the more difficult passage of the humours through such parts may be thus promoted. But when there is a great anxiety on account of the difficult passage of the blood from the right ventricle of the heart through the lungs, the greatest relief may be had by applying sponges dipped in hot water to the mouth, that by this means a sort of vaporous bath may be applied to the surface of the lungs to relax the vessels.

S E C T.

S E C T. DCXXVI.

WHICH medicines (§ 625.) being directly applied, the greatest injuries are often immediately cured (§ 622).

For all these remedies conduce to render the humours fluid and the vessels pervious; and therefore the circulation will be rendered perfectly free. For since in the cold fit at the beginning of an acute fever, it does not yet appear what course the rest of the disease will take, prudence directs to make no great alteration in the body, 'till it shall afterwards appear what is to be performed, and by what means. In the mean time that all these remedies are used, it often happens that the febrile cause which excited these disturbances is expelled from the body, by diluting the blood and rendering the vessels pervious; and thus often the greatest disorders are safely removed in their beginning, while in the mean time no manner of injury can be feared from the use of these remedies.

Of Shaking in FEVERS.

S E C T. DCXXVII.

A Tremor or shaking supposes an instability or wavering of the muscles, betwixt their tonic contraction and a relaxation, from the contracting and relaxing causes mutually succeeding each other involuntarily, and in short instants of time; hence it supposes the arterial and nervous influx to be present at one instant, and absent the next; and consequently it denotes in the beginning of the disease a stagnation of both those humours; and if it happens towards the end of the disease, it often denotes too great a want or absence of those fluids, after they have been subjected to too great a waste.

All and every one of the muscles which are moved by the influence of the will, may be contracted by the power of the mind, so as to move the parts to which they are affixed; and this new motion excited by the will is so swift, that there is no observable interval of time interposed between the cause and the effect: For I no sooner will the extending of my finger, but it instantly becomes erect. But we may also with equal ease remove the motion which is thus raised, at our pleasure; and then the part of the body will rest, which was before moved through the influence of the will by the muscles, whereupon it falls down by

by its own weight, or the ambient parts by their elasticity recover their former situations, which they lost by the preceding force of the muscles. If now we conceive a muscle to be distended by the will, soon after relaxed, then again distended, and thus reciprocally by a sudden accession and recession of the moving causes, we shall then have an idea of trembling or shaking; for we may thus be able at pleasure to cause a trembling thro' the whole body, or some particular part, by a voluntary motion of the muscles. It is therefore evident that in trembling there is a sort of instability or wavering of the muscles, betwixt contraction and relaxation.

But sometimes these causes contracting and relaxing the muscles are observed to succeed each other against the will, and then it is a morbid trembling, because it does not proceed from the desire, but against the inclination of the person, who is not able to restrain it by the influence of his will. A palsy therefore differs from a trembling, because in the last the contraction of the muscle is renewed; and it differs from a cramp or tetanus, because the contraction of the muscle is soon after followed with a relaxation.

But there is a twofold tremor observable, one wherein the limbs are agitated with a motion ceasing and renewed again alternately against the will, while the person is at rest and in his bed, and which cannot be suppressed by his will: But another kind of trembling arises only when he designs to move the whole body or some of its parts. In the first case a trembling seems to arise from such an alternate irritation in the common sensory, from any cause as excites the powers moving the muscles to act suddenly, then to cease, and then again to be renewed. But in the latter case there seems to

be a deficiency of that most subtle fluid, by the impulse of which, determined by the influence of the will, the muscles are contracted; in which case the muscles are indeed moved by the will, but are not supplied with a quantity of spirits sufficient to keep them contracted with an equal force. For we know from physiology that a voluntary contraction of the muscles, requires a free commerce betwixt them and the brain by the nerves, and that if this communication is removed by a ligature, compression or destruction of the nerve, the strongest efforts of the will cannot be able to excite any motion in the muscles; but it is likewise evident, that the most subtle fluid separated from the arterial blood, by the fabric of the encephalon is distributed from thence by the nerves, and that by the means of this, muscular motion is excited. When therefore the quantity of this fluid is deficient, the action of the muscles must be instable and weak. Thus we see even in the strongest men, that they tremble by endeavouring to lift a weight beyond their strength, because that which is to be moved exceeds the moving powers. It is no wonder therefore if tremblings arise from this cause in people weakened by too great evacuations, or violent diseases preceding, when they endeavour to move the body. But concerning this it ought to be observed, that while we are in health many muscles act which seem to be at rest. Thus when we sit upright, the head and trunk of the body are retained in that posture by the action of the muscles; and therefore when these muscles are flaccid at the approach of sleep, the head nods forward, and the trunk of the body unless supported inclines to one side or the other by its own weight. Even when we lie in bed the muscles by their action direct the posture of the body, on
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which account Hippocrates in his Prognostics so much condemns a collapſion of the body by its own weight in ſick patients; for it denotes an entire loſs of ſtrength. Hence it is evident that a trembling may ariſe in the weakeſt people, though they may ſeem to lie down and be at reſt, and that this ariſes only from the deficiency of the moſt ſubtle fluid, and not from any cauſe irritating the common ſenſory.

Theſe two kinds of trembling are very minutely diſtinguiſhed by Galen¹, who has likewiſe given them different names. *Tremor enim (τρόμος) facultatis corpus moventis & vehementis infirmitate oboritur. Quippe nemo, qui artus movere non inſtituerit, tremet. Palpitantes autem partes, etiamſi in quiete fuerint, etiamſi nullum illis motum induxeris, palpitant.* “For a trembling (ſays he) ariſes from “a weakneſs of the faculty which moves and “carries the body. For no body trembles who “does not endeavour to move his limbs. But “palpitating parts although at reſt, will palpitate “although you introduce no motion in them.” He therefore calls the firſt kind of trembling before deſcribed, by the name of palpitation, namely, when the limbs of a perſon at reſt are agitated with an alternate motion contrary to his inclination; but the latter, which happens only when a perſon endeavours to move ſome part, he calls trembling.

In both caſes the trembling ſeems to enſue becauſe the moving powers are at one inſtant applied to the muſcles, and ceaſe the next, then renewed again, and afterwards ceaſing. But that a flux of the nervous and arterial fluids into the muſcles is the cauſe of their motion, was demonſtrated at large in our author's phyſiological lectures or inſtitutes;

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and

¹ De Tremore cap. 3 & 4. Charter. Tom. VII. p. 200, 201.

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and therefore this influx must be instable, sometimes present and sometimes absent, to cause a trembling. In the beginning therefore of diseases, when the body has not been exhausted by large evacuations, nor the powers weakened by a long continuance of disease, we cannot accuse the deficiency of either of these fluids; but the only fault then seems to consist in the imperviousness of the humours obstructing the free circulation through the smallest vessels; or at least the course of the humours is not so free as is required for muscular motion, which follows in an instant of time by the influence of the will. But towards the end of diseases, a trembling often arises rather from a deficiency of either of those fluids than from their being impervious. For since the conjunct actions of all the vessels and viscera ought to conspire to the formation of the most subtle fluid called the spirits of the nerves, it is no wonder if many of the functions being injured by disease, should occasion a deficiency in the last elaboration of this fluid. Add to this, that very often many evacuations arise during the time of the disease, either spontaneously or procured by art; and at the same time those functions are either absent or languishing, by which the lost substance both of the solids and fluids ought to be supplied. Hence it is sufficiently apparent, that a different method of cure is necessary according to the difference of the cause.

But although we treat here only of a febrile trembling, yet it may not be inconvenient to add something concerning trembling, arising from other causes. For although an influx of the nervous and arterial fluid is necessary to the action of a muscle, yet there is also another determining cause required to make the fluid be conveyed in a greater quantity and velocity through the nerves into one
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or more of the muscles. This we know is performed by the influence of the will in the voluntary muscles, for which purpose a sound state of the brain is necessary: for when the brain is compressed by blood extravasated within the cranium, the person falls down apoplectic, and all the actions of the voluntary muscles cease. But the fabric of the cerebellum seems to have the same use, with respect to the muscles which are subservient to the vital motions exercised without the influence of the will, that the brain has with respect to the muscles subservient to the will. If therefore there is concealed in that first origin of the nerves called the common sensory, such a disposition as will excite an alternate influx into some nerves which lead to one or more muscles, a trembling may follow almost in the same manner as if it was performed by the influence of the mind (for we may by the will excite a trembling either throughout the whole body or some particular part) even though the nervous and arterial fluid abound in a great quantity, are both of them easily pervious, and all the vessels open, Nor need it seem so wonderful that this should happen, even though no sensible cause at all can be found throughout the whole body to produce it, only some change in the common sensory, of whatever kind it may be, manifesting itself merely by this effect; for we experience the same thing in the usual motion of the muscles, which although so sensible and capable of altering the several parts of the body with so great a force, does yet hardly seem to be corporeal in its origin, since during their action there is no apparent cause thereof, and when the motion is suppressed by the will which they excited, there no longer remains any sign or footstep thereof. But that trembling may arise from such a latent disposition in that part
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of the body, by which the motions of the muscles are excited and directed, seems to be taught us by practical observations. I have myself seen in the city of Leyden a man of a full age, who in his sleep would be roused up as it were by a dreadful noise of thunder, while in the mean time he imagined the whole house to be set on fire with lightning; after which he used to fall into such a trembling of the whole body, that not one muscle subject to the influence of the will was free from the concussion. In this condition he lived twenty years, healthy in other respects, but always sitting at his door he afforded a moving spectacle to all who passed by, every part of his body being shook with such violent tremors that he appeared red or flushed, hot, and would frequently run down with sweat even in the midst of winter: while he slept the trembling ceased or else much abated, but it returned again as soon as he waked. Tulpius^r observed a wonderful periodical trembling in a pale faced virgin plainly of a phlegmatic habit, which continued for three whole days, first invading all the limbs, and then terminating only in the arms and legs; nor yet was this trembling constantly present, but only at certain intervals, continuing near two hours each time, with a hoarseness and suppression of the voice. It is well known that tremors are frequently raised only by violent passions of the mind, and that when they have once suffered such a trembling it easily returns, even from a slight cause. Thus I saw a healthy virgin who, though possessed of a pretty strong body daily exercised with labour, fell into a very bad trembling of the whole body by a sudden fright, and which afterwards would return upon very slight occasions, although she had long persisted in

^r Lib. I. cap. 12. pag. 30.

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in the use of nervous, corroborating, and hysteric medicines. Many more practical instances might be alledged to confirm the same thing; but from those here mentioned I believe it is sufficiently evident, that a violent, lasting, and often incurable trembling may arise only from a change in the corporeal organ, upon which the exercise and direction of the muscular motion depends, even tho' nothing can be found amiss in any other part of the body.

S E C T. DCXXVIII.

IF such a shaking continues long it occasions an impediment to the circulation of the humours, and the several ill consequences thence proceeding.

Every muscle, when it acts swells, turns hard, and pale, and the turgid muscular fibres compress with a great force the intervals and blood-vessels which are interspersed betwixt them. Hence the veins dispersed through the substance of the muscles are emptied, but the arteries being compressed repel the thicker part of the red blood and transmit only the most subtle part, as may be seen more at large in the theoretical lectures or institutes of our celebrated author, § 406¹. But at the same time also the adjacent veins being compressed by the action of the muscles, accelerate the return of the venal blood. But soon after, when the muscles are relaxed, the contrary takes place; for then the muscles look red and are filled with blood. It is therefore evident, that if a trembling continues long it may disturb the free circulation of

¹ Herm. Boërhaave Institut. Medic. § 406.

of the humours through the substance of the muscles and adjacent parts, from whence many disorders may arise. Add to this, that a violent and long continued trembling is followed with a very great weariness; a remarkable instance of which I saw in a virgin afflicted with a quartan, and possessed of a very moveable or tender nervous system: for she was so violently shook for three or four hours at every fit of the quartan, that she lay miserably tired on the intermediate days, and could hardly recover strength enough in the mean time to sustain the following paroxysm. But how much use will contribute to sustain an inveterate malady with more ease, is evident from the instance of the man before-mentioned. (§ 627) who was able to support this troublesome disorder for the space of twenty years.

S E C T. DCXXIX.

FROM hence may be derived the diagnosis and prognosis of this symptom; and from thence it likewise appears, why trembling and cold accompany each other (§ 621)? Why a severe trembling is so bad? Why trembling accompanies violent passions of the mind, and why it attends towards death? Why it follows, from too profuse evacuations of all kinds? And why from drinking too much of any kind of liquor?

Diagnosis.] It is easy to distinguish whether a trembling is present, since it appears to the senses: and it is likewise possible to discover the cause from whence the tremor arises, namely, whether it be from too great a fulness, as in plethoric people, who frequently tremble, or whether it be from an imperviousness, a rest, or a deficiency of the humours,

humours, as often happens after great evacuations in the end of diseases. For a plethora is known by its signs, enumerated before at § 126, at the letter *e*; an imperviousness of the vital fluid is known to be present when the signs denote the actions of the lungs and encephalon to be injured, because a regularity of the actions depending on these viscera, requires a free course of the vital fluids through the smallest vessels; but a rest, or a too slow motion of the humours, discovers itself from a weak and slow pulse, and a weakness in the whole body: but that a deficiency of the humours offends, we know from profuse evacuations preceding, and from a collapſion of the vessels, with weakness.

The prognosis teaches us, that from a violent and long continued trembling, the same bad consequences are to be feared, concerning which we treated before at § 628. Moreover the prognosis determines whether the cure of the trembling will be easy or difficult, speedily or slowly obtained, chiefly with regard to the diversity of the cause which excited the trembling; for if it derived its origin from too great fulness, it will easily be cured by bleeding and other evacuations; if from an imperviousness of the vital fluids, it is commonly more difficultly and slowly cured; if from a deficiency of them after great evacuations, it indeed admits of a cure, if the body is not so far weakened but it is able to form good juices from the ingested aliments; but yet so much time will be taken up in the cure, as is necessary to restore the juices which have been wasted. But when the trembling arises from a violent commotion of the mind changing the common sensory, which change remains fixed, and does not go off when the passions are quieted, the cure then appears to be difficult, and frequently altogether impracticable.

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Why trembling and cold attend together?] For during the febrile cold (see § 576.) the pulse is small and often intermitting, and the paleness, &c. denote that the blood stagnates in the extremities of the vessels; whence the motion of the arterial fluid is instable and disturbed, one moment being almost at a stop, and the next arising to a considerable pitch. But the secretion of the spirits and the motion of them through the nerves, requires a free circulation of the arterial blood through the vessels of the encephalon; whence 'tis evident, that in the cold fit the equable motion of the spirits is disturbed thro' the nerves. The two causes therefore of muscular motion will be thus wavering or instable, namely the influx of the arterial blood, and of the nervous fluid into the muscles: whence it is evident, agreeable to what was said before at § 627. that the reason is easily assigned why a trembling accompanies the febrile cold.

Why a severe trembling is so bad?] Because it denotes that both the nervous and arterial fluid are either deficient or impervious; and at the same time such a violent trembling arising in the beginning of a fever, denotes much strength of the cause which is capable of exciting so great a disturbance, in a body which has been hitherto healthy. And likewise, because a great trembling supposes obstacles opposing the circulation of the humours, therefore many bad consequences are justly to be feared from thence. Moreover, tremblings which arise in the course of acute fevers or other diseases, unless they precede or accompany critical evacuations, are often of the very worst import; because they generally denote, that the matter of the disease inclines to the head, and there disturbs the equable motion of the nervous fluid in the origin itself of all the nerves, that is in the medullary substance
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of the encephalon. Hence Hippocrates¹ says, *In vehementer Phreneticis tremores letbales*. "That tremblings in highly phrenetic patients are fatal." Also², *Quibus ab atra bile mente motis tremores fiunt, malum*. "That tremblings are bad in those who are indisposed in mind from an atrabiliary humour." And in another place³, *Palpitantes per totum, an voce capti intereunt*: "That those who are taken with palpitations or tremblings throughout the whole body, or lose their speech, perish." An instance of which last assertion he gives us in the history of his fourth patient in the third book of his Epidemics⁴, who being phrenetic lost his voice on the second day in the morning, and had palpitations throughout the whole body; but on the fourth day he perished. Many more instances of the like kind might be alleged from Hippocrates; but these may suffice to prove what an ill omen trembling often affords in diseases.

Why trembling accompanies violent passions of the mind?] That the whole common sensory is capable of being disturbed by violent passions of the mind, no one doubts; and many instances have been mentioned in proof of this in the comment to § 104: it is therefore no wonder if a trembling and irregular influx of the nervous spirits into the muscles should from thence proceed. But although people who are possessed with the most intense anger, or the greatest joy, often tremble throughout their whole body, yet a trembling follows more especially from great fear beyond any other affections of the mind; and therefore fear is often represented by authors under the word trembling.

¹ Coac. Prænot. N°. 99. Charter. Tom. VIII. pag. 857.

² Ibid. N°. 95. & Prorrhetic. Lib. I. N°. 14. Charter. Tom. VIII. pag. 710.

³ Coac. Prænot. N°. 347. Charter. Tom. VIII. pag. 871. Prorrhetic. Lib. I. N°. 29. *ibid.* pag. 718.

⁴ Charter. Tom. IX. pag. 298.

bling. Thus we read in the poets, who exactly represent nature, that men struck with fear tremble. Dolon being sent as a spy from Hector, and taken by Diomedes⁷, stuttered; his teeth shook and clashed together, and all his limbs trembled. We observed before in the comment to § 627. that an incurable trembling arose only from a fright, and continued for the space of twenty years. It is therefore evident, that such a disturbance may arise in the common sensory from violent passions of the mind, and that the motion of the spirits being disturbed, even from slight causes, may occasion a violent trembling, even though the body be perfectly healthy in other respects.

And why it attends towards death?] It was said before in the comment to § 627. that a trembling supposes the influx of the nervous and arterial fluid to be sometimes present and sometimes absent: but the uncertainty or wavering state of the pulse, intermitting towards the approach of death, demonstrates that the blood is scarce any longer able to pass through the lungs from the right to the left ventricle of the heart; and therefore the heart is not contracted strongly, but trembles and palpitates with a swift motion, 'till after a few minutes so great a quantity of blood comes into the left ventricle, that being thence irritated it contracts more powerfully, and drives the contained blood into the arteries with a greater force: hence at that time there will be a greater influx of the arterial blood into the muscles, and a stronger impulse thereof to the encephalon, whence the motion of the spirits through the nerves will be increased: but soon after, all these effects cease, 'till the heart being at length filled again, is excited to renew its contraction. It is therefore evident, that towards death the influx of the nervous and arterial

⁷ Homer. Illiad. Lib. X. ver. 188, 189.

rial fluid is present one moment and absent the next, whence a trembling ensues. Hence Hippocrates says ^z, *In perniciose jam habentibus parvi tremores* (τὰ σμικρὰ τρεμώδεια) *Et æruginosi vomitus, lethales.* “That slight tremblings and vomiting of green matter are mortal signs in those who are dangerously ill.”

Why it follows from too profuse evacuations of all kinds?] To continue an equable circulation of the humours it is necessary for the vessels and more especially the arteries to be full: for there are two causes by which the blood is moved through the vessels, as appears from physiology; namely, the force of the heart expelling the blood into the arteries and dilating them; and then the contraction of the distended arteries themselves, urging forward the blood while the contraction of the heart ceases and is filling again. But unless the arteries are first distended, they do not contract themselves; nor can the heart distend the arteries, unless they are full at the same time when the heart propel its contained blood into them. For if the arteries are empty or so little filled, that in the least diameter of their contraction, their sides do not come into contact in every point with the surface of their contained fluid, it is very evident that the blood expelled from the heart may enter the arteries without dilating them; and therefore no contraction of the arteries will follow. But since the larger arteries are strong elastic canals, they will not collapse even though there is a deficiency of their distending fluid, but they will remain in the smallest diameter of their contraction; and therefore if there should be so great a loss of the fluids that the arteries are not full enough in this their greatest contraction, it is evidently impossible for the systole of the arteries

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^z Coac. Prænot. N^o. 64. Charter. Tom. VIII. pag. 856.

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to act upon their contained humours, and therefore death or a rest of them all will follow. But when a profuse evacuation has only consumed such a quantity of the humours that the arteries still continue to be distended in some measure by the blood expelled from the heart, though with a weak force, the circulation will not altogether cease, but become languid and unequal; and therefore for the reasons before-mentioned the arterial and nervous influx into the muscles will be wavering and unstable, whence a trembling will follow. Thus we see in the killing of animals, that when a great quantity of blood has been evacuated, a trembling follows. After profuse diarrhæas, cholera morbus, and other such sudden and profuse evacuations, tremblings ensue, as we are taught by daily observation.

Why from drinking too much of any kind of liquor?] When liquors are daily taken into the body in a great quantity, the mass of humours to be transmitted through the vessels is increased; whence a greater distension of the vessels will ensue, beyond what they were usually subject to: but too great a distension, especially when often repeated, is followed with a morbid weakness in the fibres, as was said before in the comment to § 25. N°. 3. and hence the vessels may indeed be more easily dilated, but then they will re-act with a less force upon the distending fluid; and yet it is upon this re-action of them that the motion of the humours through the vessels is in part carried on, as we said before. Besides this, when the liquors drank have been discharged from the body by urine, sweat, &c. the fibres before distended and weakened do not contract themselves with a sufficient strength towards their axis, so as to propel their contained fluid equally in all directions; and
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hence the same consequences will follow as those before-mentioned from too profuse evacuations. Hence the reason is evident why those who are daily accustomed to the abuse of warm watery liquors, by drinking them in great quantities, are afterwards so frequently punished with a trembling of the limbs; which disorders are still more increased, because the fluidity of the blood from these watery drinks being augmented, all the vessels and viscera are more weakened; (see § 43. N^o. 3.) and therefore the ultimate elaboration of the most subtle fluid, namely the nervous spirits, will be less happily performed; but the most troublesome trembling of all frequently follows from the abuse of wine or fermented spirits, for there is a much greater distension of all the vessels observed from these than from watery drinks: and hence such unhappy people are observed to be altogether trembling and incapable of the several offices of life, unless their veins are constantly kept distended with wine; and thus they are obliged to have recourse to the same liquors again, even against their inclination, and even in opposition to their better knowledge and approbation. See more concerning these liquors in the comment to § 605. N^o. 11.

S E C T. DCXXX.

SUCH a trembling is cured by restoring the equable flux and pressure of the arterial fluid through the arteries, and of the nervous fluid from the brain and cerebellum into the moving fibres : and this is to be done in the beginning of the disease by such things as dissolve the febrile lentor, and recover the strength ; (§ 606, to 617.) but towards the end of the disease it is relieved by such things as speedily restore the lost humours, and strengthen the fibres and viscera. (See § 46, to 50.)

It appears from physiology *, that a free course of the spirits is necessary from the encephalon, flowing through the nerves into the moving fibres, to perform the action of the muscles ; and also at the same time for the blood to be freely distributed by the artery throughout the whole substance of the muscle : but whatever impedes this influx, either by injuring the encephalon, medulla spinalis or nerves thence arising, destroys the motion of the muscles ; but also the same is likewise true of the arteries tending to the muscles. So soon therefore as a due quantity of both these fluids are sent to a muscle, while both the vessels and fluids are pervious, these motions are excited in all the voluntary muscles by the least influence of the will, as we find ourselves able to perform them with ease, pleasure, and a certain constancy during health : trembling will therefore be cured by this means, as

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* H. Boërh. Institut. Medic. § 401.

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it consists in a wavering or instable disposition of the muscles betwixt contraction and relaxation; (see § 627.) and therefore it supposes an incapacity in the muscles constantly to perform their motion; but when this equable and nervous influx of the arterial fluid cannot be restored, the trembling remains incurable, as it is observed sometimes; for example, when such a change has been made in the corporeal organ (by which the mind as long as it is united to the body determines the motion of the spirits into all and every one of the muscles) that thence the equable influx of the spirits into the muscles is disturbed in its determination by this its first spring or corporeal origin.

But in a febrile trembling one ought carefully to distinguish whether it be observable in the beginning or towards the end of the disease. For in the beginning the fever cannot yet be accused of wasting too much the vital fluids, unless very profuse evacuations have been made in the beginning of the fever, which may be easily known: but at this time of the fever the trembling usually arises from a lentor, by which name we understand every obstacle impeding the free motion of the humours through the extremities of the small vessels where the impediment is formed, whether from a fault of the vessels or humours, or of both together; and therefore the removal of this lentor will likewise cure the trembling. But in what manner this lentor ought to be removed, and what different remedies are required for this purpose, has been sufficiently declared at large under the aphorisms above cited. But every thing which removes the lentor likewise restores the strength, because the weakness in the beginning of the fever proceeds from obstruction, and not from inanition. But towards the end of the disease the lentor being dissolved by

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proper remedies, and a due moderation of the fever itself, the trembling that attends requires a very different method of cure. For then it arises either from a deficiency of the nervous and arterial fluids, or from a too weak motion of the humours thro' the vessels. The indication therefore calls for a restitution of what is lost with the greatest expedition, or else for an increase of their too weak motion. The first is performed by taking in such nourishment often and in small quantities, as may be digested by the functions of the body now weakened by the disease, and so as to be easily converted into healthy humours: but concerning these see what has been said in the comment to § 28. But too weak a motion of the humours is to be increased chiefly by strengthening the vessels and viscera: for during the violence of the fever all the vessels were too much distended by the humours overheated and rarefied by their too great motion; but after the fever is abated, the body exhausted of its best juices grows languid, the vessels collapse, and are weakened by the too great distension preceding, whence it is necessary to strengthen them; but by what means they may be thus strengthened has been also explained under the aphorism cited in the text. But here more especially frictions and exercises of the body are of the greatest use, because by these means the vessels and viscera are happily strengthened, and the celerity of the motion of the humours may be thus increased at pleasure, without need of any stimulating remedies. But by increasing the strength of the vessels and viscera, the ingested aliments are sooner and better changed into our own nature, and therefore by the same remedies a speedy restitution will be made of the lost humours.

From

Señ. 630. Of Shaking in FEVERS. 439

From what has been said it is evident, that the method which is best to cure a febrile trembling in the beginning of the disease, is altogether pernicious when applied in the end of the disease, and the reverse: this will appear more evident by example. When in an acute inflammatory fever the lentor renders the circulation of the blood difficult and unequal through the vessels of the encephalon, all the functions of that viscus may be disturbed, and consequently a trembling produced; but in this case repeated bleeding with cooling clysters, antiphlogistic purges, a thin diet, &c. are of the greatest use. But if in the end of an acute fever the body, being exhausted by the disease and preceding evacuations, is invaded with a trembling, in that case these remedies will increase the cause of the trembling, namely too great inanition, and bring on consequences certainly pernicious. But flesh-broths, a moderate use of wine with frictions, exercise of body, corroborating and stimulating cordials, &c. are then of the greatest use, when in the first case they would have been highly pernicious. It is therefore evident, that in the cure of a febrile trembling one ought to attend to the time of the disease wherein it happens.

Of Anxiety or Oppression in Fevers.

S E C T. DCXXXI.

ANGUISH or anxiety in fevers has for its cause an obstruction of the blood coming out of the heart; which therefore supposes that the course of it through the extremities of the aorta and pulmonary arteries is almost impracticable; hence it also supposes a spasm or cramp of the small contracted vessels, or else that the inflammatory matter is very incapable of passing through them: the like anguish we observe from an obstruction in the course of the blood through the vena portarum from the same causes, because all the venal blood brought thither from the cæliac and mesenteric arteries, being incapable of returning, stagnates, distends the vessels, and resists the affluent blood coming next from the arteries, whence it produces all the disorders that either do or may follow from thence; whence it is evident, that these two causes of anxiety ought to be very carefully observed and treated in every acute disease.

Pain and anguish are those things which are capable of rendering the condition of man miserable; and therefore these are so much detested by human nature, that we use all our endeavours to remove every thing which may be the cause thereof. But as the displeasing sensation in the mind which we call
 pain

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pain cannot be explained in words (see § 220) so the same is also true of anxiety; for he only is sensible of this who suffers the anguish. But although we cannot distinctly understand that change in the mind which attends anguish, yet we may be able to enquire into the changes which arise in the body from the perception of anxiety in the mind: for this will be sufficient for the purposes of the physician, whose business is the care of the body and not of the mind. We shall therefore carefully search after the corporeal changes, which either precede or accompany the sense of anguish; and when these are known we shall see by what methods, and by what remedies those changes may be speedily and safely removed, because this most troublesome disorder requires speedy relief.

When the heart cannot expel the blood contained in its cavities by driving it forward through the arteries, anguish is perceived, and the greater as the obstacle impeding the free egress of the blood from the heart is more powerful or resisting. But so long as life continues an ingress of the venal blood into the cavities of the heart, an expulsion of it from thence into the arteries is absolutely necessary (see the comment to § 1); and therefore in this case anxiety denotes that life is dangerously attacked even in its fountain head; and therefore it is evident how much danger then attends. But that the sense of anguish is then perceived, when the free egress of the blood is hindered from the cavities of the heart, appears from the most certain observations. For towards death the most intolerable anguish attends, and the last agonies and struggles of dying people seem to be nothing more. Those unhappy people who have polypose concretions in the cavities of the heart, or larger blood-vessels near the heart, suffer the most dreadful anxieties,
whenever

whenever the velocity of the blood is accelerated by a bodily exercise ; whereas when they are perfectly at rest, they find themselves well enough, because the blood moving gently, easily slips by, and is expelled through the arteries. Does it not therefore seem that as the sense of pain denotes that a dissolution is threatened to the nervous fibres arising from the brain, so anguish denotes the vital viscera and life itself to be in danger ? Certain we are, that the heart however swiftly agitated in a most acute fever, and the lungs stuffed up with impervious blood in peripneumonic patients, do neither of them feel pain, but the most intolerable sense of anguish is perceived, obliging the patient even against his will to alter his situation of body, or to use any other endeavour to alleviate so desperate a malady. But whether or no as the idea of pain is excited in the mind by the extension of the nervous fibres arising from the brain, so the sense of anguish proceeds from the nerves dispersed through the vital viscera from the cerebellum, but not from the brain, must remain a question, however probable.

But since the right ventricle of the heart drives the blood through the pulmonary artery, and the left ventricle propels the blood thro' the aorta, it is evident that the cause of anxiety, namely the obstructed egress of the blood from the heart may reside both in the pulmonary artery and in the aorta. But such an impediment or obstacle is most frequently found in the pulmonary artery, because the blood propelled by the right ventricle into the large trunk of the pulmonary artery, is immediately obliged to pass through its most narrow extremities into the veins, and from them into the left ventricle ; and therefore the blood will hesitate immediately in its passage through the lungs. Even the blood being propelled through the narrow extremities of the pulmonary artery, becomes fit to flow through

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through all the other vessels in the body, as is demonstrated by physiology; and therefore when the blood arrives into the left ventricle, it will be able to pass through the extremities of the aorta, unless it be altered in its course through the lungs, either from a narrowness of the vessels, an error of place, or a loss of its most fluid parts, with cold, &c. Moreover, while there is an obstacle or impediment about the extremities of the aorta, hindering the left ventricle from freely discharging its blood, that will also prevent the pulmonary veins from discharging their blood into the left ventricle; hence the lungs will be stuffed up in a little time, and a great resistance formed to the right ventricle, Hence it is evident that anxiety arises from the egress of the blood impeded from the heart, and stagnating more especially in the right auricle and ventricle, and extremities of the pulmonary artery.

But as we here treat of anxiety as a symptom in fevers, the obstructed course of the blood will arise either from a spasm and constriction of the small vessels, or from the imperviousness of the blood to be transmitted, which, in this case, almost constantly proceeds from an inflammatory viscosity therein. For although many other causes, as for example, scirrhus or suppurating tumours, &c. by an external compression may straighten the vessels, and impede the free egress of the blood from the heart, and also polypose concretions, and a mucous, cold, indisposition of the blood, &c. may render it impervious through the vessels, yet these have no share in the present consideration, because we here treat only of the history of a fever and its symptoms.

But it is very evident that the same effect must follow, whether the capacity of the vessels be diminished, without altering the fluids, or whether the
vessels

vessels retaining the same capacity the fluids become less pervious, as we explained it more at large in the history of obstruction. But that the capacity of the vessels may be lessened, when their muscular fibres are contracted with a spasm, we are taught by experiments and observations. For the arteries act upon their contained fluids, not only by their elasticity, but they have also truly muscular fibres, as we are taught from anatomy, by the contraction of which fibres the capacity of the arteries may be streightened: but that the contraction of these fibres may be increased is evident from what follows. When the most healthy person is suddenly struck with fear, every part of the body is contracted and looks pale; for the arteries being constricted by a spasm of their muscular fibres repel back the red blood, as is evident even to the eye in the whole external skin. But that the same constriction likewise happens in the internal parts we are taught from the sighings, anguish or oppression, and difficult respiration which then happens from the difficult passage of the blood through the extremities of the pulmonary arteries contracted with a spasm. The same thing likewise appears in the cold fit of intermitting fevers; for the extremities of the vessels being contracted, and the powers of the heart weakened, as is evident from the paleness, a great resistance begins to arise to the blood expelled from the heart, and from thence often follows very great anxiety during the time of the cold fit in fevers, especially when severe; and even those who die of these fevers almost constantly perish in the cold fit.

But the imperviousness of the humours to be transmitted through the vessels, without lessening the capacity of the last, may hinder their free course through the extremities of the pulmonary artery and
aorta.

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aorta. For (as we said before in the comment to § 382. N°. 8.) there is a natural propensity in our blood to concretion, whence it spontaneously concretes by rest: and health remains so long as the efficacy of the vessels and viscera is able to subdue this inclination in the blood to concrete. But it was proved before (§ 587.) where we treated of the effect of fevers, that they expelled the most fluid parts of the humours, and incrassated the rest; whence it follows that the blood's cohesion may be increased by a fever, and consequently its passage through the extremities of the arteries may be thereby hindered. But when this fault of an increased cohesion arises in the blood, almost the first sign thereof is perceived in the lungs, because the blood is drove immediately from the right ventricle into the narrow extremities of the pulmonary artery. Hence follows a difficult and short respiration, a tossing or restlessness of the body, anguish and ill-sufferings of the patient, as they are called by Hippocrates, which afford certain signs, whereby we are taught that such an imperviousness arises in the blood as begins to impede its free course through the ends of the arteries. Hence in all acute diseases these signs are justly esteemed of the worst import.

The same anguish we likewise see arise from the obstructed course of the blood through the vena portarum from the same causes.] Another cause of anguish, and a very frequent one, is the blood's course impeded through the branches of the vena portarum, likewise occasioned by the vessels constricted with a spasm, or from an imperviousness of the blood. For it is well known from physiology that all the venal blood of the stomach, intestines, mesentery, pancreas, spleen, and omentum, is all collected in the one vena porta, except that small portion

tion of the blood, which remaining after it has performed the nutrition of those parts, is sent into the cava by particular veins; but the porta having entered the liver acquires a strong coat like that of the arteries, and immediately after dividing into large branches, it is then distributed in an infinite number of smaller vessels throughout the whole substance of the liver, and having completed the secretion of the bile, the remaining blood is received by the small veins, and poured into the cava. It is therefore evident that the blood conveyed from the chylicative viscera into the vena portarum, must again pass through converging vessels, so as to become twice venal before it returns to the heart: and therefore it is evident that the transmission of the humours thro' the liver must be more difficult, as the venal blood must be forced thro' the ultimate small extremities of the vena portarum in the liver without any new or additional force from the heart; and therefore an impediment or obstruction may be easily formed to the free course of the humours through this part, in those people who are deprived of the healthy exercises of body. But whether the obstruction be formed about the ultimate extremities of the vena portarum distributed through the liver, or in the biliary ducts, or in the common excretory ducts of the latter, the effect will be nearly the same; namely, the course of the blood thro' the vena portarum will be impeded, and therefore the venal system of the chylicative viscera will not be able to empty themselves into that vein: but these veins remaining full and distended, the arterial blood brought by the cæliac and mesenteric arteries, which ought to discharge themselves into these veins, will likewise stagnate, and therefore a greater resistance will arise in these arteries to the blood sent through the aorta; therefore the left
ventricle

ventricle of the heart will be less able to empty itself into the trunk of the aorta, until those obstacles are removed, or the other branches arising from the aorta being dilated, may receive the blood which otherwise used to pass through the cæliac and mesenteric arteries.

Perhaps from this cause it is that a greater quantity of blood being drove through the emulgent and adjacent arteries, a greater quantity of urine is separated, which is a symptom commonly appearing in this kind of anguish; and this more especially, if it derived its origin from a spasm or convulsive constriction of the vessels, from an inordinate motion of the spirits. For (*cæteris paribus*) the quantity of secreted liquor will be greater, as a larger quantity of the humour from whence it is separated is applied to the secretory organs in the same space of time.

This kind of anguish very often occurs in practice, namely, that arising from an obstructed course of the blood through the vena portarum. For in many people, who seem in other respects healthy, an intolerable anguish arises of a sudden; and is succeeded with most troublesome vomitings, and soon after the whole body appears discoloured, as in a jaundice, whereupon the anguish then ceases: afterwards the bile mixed with the blood is gradually washed out by urine, the yellow colour of the skin vanishes, and recovers its healthy appearance; but some weeks after this, more or less, these symptoms usually return again in the same order. The dissection of dead bodies has taught us (as we shall declare more at large, when we come to treat of a jaundice) that in these people the common, or else the cystic duct of the bile is so obstructed by small stones, concremented bile, a tumour of the adjacent parts, &c. that the bile separated from the blood of the vena porta-

portarum cannot evacuate itself by those ways: whence it is accumulated, distends the receptacles in which it is collected, and fills the biliary ducts, so as to obstruct the blood of the vena portarum from whence the bile ought to be secreted, whence the greatest anguish ensues, until the bile is repelled by vomiting, as a salutary effort of nature, or by mixing with the blood it occasions a jaundice. For when a person vomits, the viscera contained in the abdomen are all of them compressed with a powerful force, by the convulsive motion of the diaphragm and abdominal muscles; and by this compressure the secreted bile is repelled with a retrograde motion into the branches of the vena portarum; through which it either returns by the corresponding branches of the vena cava into the blood, or else is often repelled back with the blood of the vena portarum into the arteries. For the course of the blood in the arteries may be retrograde, so as to resemble that in the veins, if a greater resistance is made towards the arterial extremities, exceeding the power urging their contained fluid from the basis towards the apex (as was said in the comment to § 141. N^o. 1.) Since therefore a resistance is formed in these veins to the course of the arterial blood flowing into them, by some obstacle placed about the extremities of the vena portarum; therefore when these parts are compressed by vomiting, the blood may be repelled into the arteries, more especially as there are no valves in the branches of the porta dispersed through the mesentery, which might resist this retrograde course of the blood, as we are taught by Ruysch *. From hence also appears the reason why the stomach or intestines being distended with flatulencies, anxiety follows, because the vessels being compressed by the tumour of these parts

* Adversar. Anatom. dec. 2. pag. 11.

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parts hinder the free course of the humours; but this anguish is immediately relieved upon a discharge of the flatus.

If therefore anxiety arises in an acute disease, it always deserves the strictest attention, since it is often followed with so many bad consequences, as are mentioned in the aphorism next following. Physicians often repent too late the errors committed in this respect, when for want of caution, and through hurry of business, they have neglected the complaints from anguish. A diligent enquiry ought therefore to be always made after the cause of the anguish, and the part of the body, wherein it is seated. For the greatest danger attends the anguish arising from the course of the blood impeded through the pulmonary arteries: but that is less dangerous which proceeds from an obstructed passage of the blood through the vena portarum, though even thence the worst consequences may follow: but that kind of anguish is of all the least dangerous, which arises from flatulencies and a spasmodic contraction of the vessels through an inordinate motion of the spirits, as is often observed in hysterical and hypochondriacal people. But by what signs these different kinds of anguish may be distinguished, will be declared hereafter.

S E C T. DCXXXII.

IF therefore such an anguish (§ 631.) continues long, it occasions polypose concretions about the vital organs, inflammations, sudden gangrenes with an intolerable oppression and agonies, soon followed with death; but if the anguish is seated in the hypochondria, it then occasions the greatest uneasiness about the stomach, because the other viscera have their sensation less exquisite; after this it occasions sudden putrefactions of the blood in the large and weaker vessels of these hypochondriacal viscera; whence gangrenes, a putrefaction of the liver, and a fatal dysentery from the putrid matter.

If the cause of anxiety is seated in the vital viscera, namely in the heart and lungs, it denotes that the course of the blood is impeded from the heart, as was said in the preceding aphorism. But this disorder is known to attend from the injury of the vital actions; namely the pulse and respiration. For as the blood cannot be freely expelled from the heart, the arteries will not be dilated, whence the pulse will be weak and wavering; and from the same cause there will be in a little time a coldness of the extreme parts, because the blood cannot be propelled to the most distant parts of the body. But since a dilatation of the lungs by the inspired air is required to give a free course to the blood, expelled from the right ventricle of the heart, through the narrow ends of the pulmonary artery; and it was demonstrated in the preceding aphorism

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that the course of the blood would soon be obstructed through the lungs, if the obstacle to the free egress of the blood lay originally in the aorta; from thence the reason is evident, why in this kind of anguish the patient uses all the efforts of respiration to procure a passage to the blood hesitating in the pulmonary artery; hence those sighings with a short and difficult respiration, which they endeavour to relieve by sitting up in the bed with an erect posture of body, all which are much condemned in acute diseases by Hippocrates. Therefore a difficult respiration with a wavering pulse and coldness of the extremities denote that the cause of anguish is seated about the vital organs, and that death is at hand, unless timely relief be given.

For when the blood hesitates in the venous sinus's and auricles, incapable of being propelled through the extremities of the arteries, it stagnates and concretes in a short time, since it is in its own nature so apt to congeal, even in a healthy person. But the most fluid parts separating from the grosser, will as yet be able to pass through the arteries, while the rest becomes so much more inspissated, and forms polypose concretions, which frequently are incapable of being dissolved ever after during life, if the patient recovers from the present danger. Moreover, while the impervious blood is urged into the narrow extremities of the arteries by the force of the adjacent heart, and is more powerfully agitated by the fever (see § 371.) the vital viscera will be inflamed, and for the same reason the inflammation there raised will suddenly turn into a gangrene (see § 328, and 422.) which is certainly and speedily mortal (see § 432.) as frequently is known by sad instances in a most violent peripneumony. At the same time

there is also an intolerable oppression, which obliges the unhappy patient to be continually changing his posture of body, and tossing himself every way in the bed, 'till the lungs being totally stuffed up, the patient expires suffocated.

But if the anguish is seated in the hypochondria, &c.] Although this kind of anguish is not so fatal as the first, yet many bad consequences are to be feared from thence, and it likewise oppresses the patient with the most intolerable sense of anguish or uneasiness. But this is distinguished from the former in that the respiration is not so much impeded, and the pulse of the artery, though feverish, is sufficiently free. But it ought more especially to be observed, that although the chief obstacle to the course of the blood through the vena portarum lies in the liver, yet the chief sense of illness is perceived about the stomach, and more especially about its upper orifice, which is usually called cardia; for in this place the patient has a most troublesome sense of oppressing weight, soon after which they look yellow as in a jaundice by the return of the bile into the mass of blood. To this place they always point, and I have even sometimes seen them beat it with their fist, when they have been impatient of the extreme anguish. We know from anatomy that large nerves of the eighth pair are seated round the upper orifice of the stomach, and from thence they are distributed through all the other viscera of the abdomen; perhaps hence proceeds that sense of anguish in this part, when the circulation of the humours through the abdominal viscera is disturbed from the course of the blood being impeded through the extremities of the vena portarum in the liver. For although in the other viscera from the same cause a great distension may arise, when the arteries cannot
in

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in the mean time empty themselves of the blood which they bring into the veins, yet either these viscera are less sensible, or at least the sense of anguish from that cause is not perceived in other parts: I have often seen wandering pains in various parts of the abdomen, sometimes about the spleen, and sometimes in the intestines, which have preceded a periodical jaundice; and the like observations we read to have been made by others: but then this sense of anguish and indisposition lies chiefly about the stomach. When Helmont^b observed this, he pronounced, *Icterus namque nusquam alibi viget magis, quam in atrio stomachi, unde suas excitat anxietates & suspiria, designans ibidem tesseram suæ ferociæ versari.* “That a
“ jaundice reigned in no part more than in the
“ entrance of the stomach, from whence it excites
“ its anguish and sighings, displaying there the
“ signs of its violence.”

If now we consider that the blood stagnates in the whole system of the vena portarum, and that the whole liver is stuffed up with impervious blood, it will easily appear how many and how great disorders are to be thence feared. For the blood of the vena portarum contains the immediate matter of the bile to be separated by the intricate fabric of the liver; but the vessels containing the bile already secreted are compressed by the adjacent obstructed and distended vessels, and frequently also the excretory ducts of both kinds of bile, namely the cystic and hepatic, are obstructed in these diseases, whence the worst putrefaction must be expected. For it is observed that the bile very speedily corrupts by stagnating, as it also does by too great a febrile heat; and in the dead bodies of

G g 3 animals

^b In fine Capituli: confirmatur morborum sedes in anima sensitiva, pag. 451, N°. 13.

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animals the first signs of beginning putrefaction appear about the liver. If now the blood is at the same time urged in these obstructed vessels by the force of a fever, there is just reason to fear a destruction of the vessels, an extravasation of the humours and a gangrene, and this more especially as the liver is so soft and pliable, that its tender fabric may be easily broke even by a rough handling. Hence the reason is evident why a most putrid vomica or abscess is so often found in the liver after a jaundice; and why when the liver is sometimes dissolved into a putrid mass, the most foetid matter occasions a fatal dysentery. When continual remitting fevers were epidemical in these parts in autumn a few years ago, attended with a slight inflammation of the liver, we observed this anguish with a saffron colour of the urine, and a yellowness in the tunica adnata of the eyes, as in a jaundice; but it then appeared by many instances, that these fevers being badly cured by the bark, before the obstruction in the liver was removed, a great many were carried off by a most putrid dysentery, following after the anguish and weakness had continued for a long time.

S E C T. DCXXXIII.

HENCE the physician derives a just acquaintance with the cause, nature, and presages of this anguish (§ 631, 632.) and at the same time will be able to distinguish betwixt the anguish arising only from a disorder of the nervous system without any preceding fever, and betwixt that which
arises

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arises from an acute inflammation, which in that case has first shewed itself by its proper signs: and from thence by comparing these particulars together with the violence, duration, and part affected by the disease, he will be able to make a prudent discovery of the reason why anguish at last closes the tragedy almost in every disease towards the article of death? Why a spasmodic or nervous anguish is but little dangerous, and why an inflammatory one is extremely so? Why restlessness, tossings, sighings, difficulty of breathing, and constant wakefulness, are the forerunning messengers of death in most inflammatory and suppurative diseases.

From what has been said in the two preceding aphorisms, it appears that anguish is distinguishable into two kinds, one of which, being seated about the vital viscera, acknowledges for its nature and cause an obstructed egress of the blood from the heart, and impracticability of its course thro' the extremities of the arteries; and more especially an obstruction is then formed about the extremities of the pulmonary artery, as we demonstrated before. This kind of anguish is known by a difficult respiration, a weak and irregular pulse, a coldness of the extreme parts of the body, and great oppression. This anxiety is always of a bad presage, because there is reason to fear either sudden death, or the formation of polypous concretions by the blood here stagnating, whence afterwards follow dreadful palpitations of the heart, greatly increasing upon the least motion of body, with faintings, difficulty of breathing, and many

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more of the worst symptoms. The other kind of anguish has its seat in the hypochondria, and is distinguished from the first, in that the pulse is here little or nothing altered, nor is the respiration so much injured, since the obstruction is neither in the lungs nor in the arteries, going out of the heart, but is fixed about the extremities of the vena portarum: the principal sign of this last is the sense of an intolerable oppression about the cardia or left orifice of the stomach. But although this last anguish is not so dangerous as the first, yet many bad consequences are thence to be feared, as we have already seen in the preceding aphorism.

But it ought more especially to be distinguished in every anguish, whether the course of the blood through the narrow extremities of the arteries is impeded from an inflammatory thickness of the blood; or whether the capacity of the vessels themselves is contracted by a spasm; for these different causes require a very different method of cure. For in some people the nervous system is so easily moveable and susceptible of irritation, and the motion of the most subtle fluid is so easily disturbed, that the greatest anguish, constriction of the vessels, wonderful pains, convulsions and the like, arise even from slight affections of the mind. But, how frequently this cause of anxiety is to be found, we are taught by Sydenham^e, who has so accurately described the history of that wonderful and multiform disease, which is by physicians usually termed an hysterical or hypochondriacal fit: for he has observed that half our chronical diseases proceed from that affection. For there are very few women altogether free from this disease; and if any, 'tis those who lead a life
subject

^e In Dissertatione Epistolari de Passione Hysterica, pag. 486.

subject to hard labour : and even most part of the men who give themselves up to the study of learning, or lead a sedentary life, are obnoxious to the same diseases. But Sydenham has observed it as a thing most surprising in this disease, that in whatever part of the body this disturbance of the spirits invades, immediately such symptoms are produced as are conformable to the part, so that it resembles almost every disease, and may easily lead the physician into error, unless he is very skilful and carefully attends to every circumstance. The fore-mentioned author has enumerated the various appearances of this disease almost through every part of the body, and has taught that all these disorders, however different they may seem, proceed nevertheless from one root, and may be removed by the same method. For the nature or essence of this disease consists in the nervous system being too easily moveable, and in the spirits being less firm ; which last, as Sydenham^d expresses it by an admirable phrase, *Supremum in scala materiae gradum constituunt, in ipso entis immaterialis confinio positi.* “ Make up the most supreme step in the scale of “ matter, being placed at the confines or limits of “ the immaterial being itself.” For as is the condition of the blood, such will be that of the serum, and such the lymph, and all the thinner humours which seem to be thence secreted ; but in weak girls, and in men who look pale by continual application to books with little or no exercise of body, the blood taken from a vein looks like a reddish water ; whereas the blood of a rustic exercised with hard labour immediately congeals into a solid, scissile mass ; and even the serum itself of the blood in these laborious men, is often too much inclined to concretion ; and hence it seems very probable

^d In Dissertatione Epistolari de Passione Hysterica, pag. 503.

probable that this most subtle fluid of the nerves in us may have various degrees of cohesion, as well as the blood from whence it is derived. But we see daily that the most tender girls and weak men, who have such a loose texture of the blood, are soon thrown into a disturbance all over by the slightest passion of the mind, and are immediately put into a trembling by the slightest alarm, while the hardy ploughman would scarce take fright, even at the ruin of the world: nor does it seem that this intrepidity ought to be ascribed in such a man to insuperable strength and magnanimity of soul, but it only proceeds from hence, that his body being rendered hard or callous by daily labour, is less affected by the same shock, while the compages or texture of all his juices is likewise more firm. For as Sydenham observes ^d, *Animi enim robur & constantia, quamdiu hoc corporis luto is incrustatur, a firmitudine spirituum eidem famulantium maxime pendet.* “Strength and constancy of mind, so long as it remains incruited over with this body of clay, depends chiefly on the firmness of the spirits dwelling therein.” It is therefore an unjust treatment which is offered to hysterical and hypochondriacal people by their friends, and often physicians, who blame them as if it were their own fault for being disturbed at such slight causes, or as if they could allay those disturbances by reasoning. For as Sydenham observes ^e, *Non citius remedium adferet pertinax aliquod vel insolentissimi stoici decretum, quam odontalgiam præcaverit is, qui firmiter statuerit, se nullo modo permitturum, ut dentes dolore pertententur.* “An obstinate or insolent stoical decree or maxim will no sooner relieve such unhappy patients, than

“ he

^d Sydenh. ibidem.

^e Ibidem.

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“ he would be able to prevent the tooth-ach, who
“ should firmly assert that he would by no means
“ consent for the teeth to be disordered with pain.”

But this anguish arising from a disorder of the nervous system, is known from its being preceded with no fever, and from the patient's habit being such as denotes the solids to be very tender, and the fluids less firm, while there has been some antecedent commotions of the mind, or sudden and profuse evacuation of the fluids, excited either spontaneously, or by the taking of vomits, purgatives, &c. for daily observations teach us, that hysterical and hypochondriacal people find themselves greatly indisposed by the stronger evacuating remedies of any kind. But the most certain and pathognomonic sign of all is, when such patients discharge a great quantity of a very limpid urine, either a little before, or while the anguish is present. By this flux of urine Sydenham confesses that he was chiefly enabled to discover this wonderful disease, while putting on various faces it resembled almost every other disorder. But that kind of anguish or anxiety which arises from an inflammatory viscosity of the blood, and from an impediment of its course through the extremities of the arteries, is accompanied with a fever (see § 588.) and is almost constantly preceded with an acute fever, and being attended with the signs of inflammation (§ 382.) it is thereby sufficiently distinguished from that anxiety which arises from a disturbance of the nervous system. But how necessary it is carefully to distinguish these kinds of anguish by their proper signs, will be made evident in the following aphorism, treating on the cure of anxiety, which is often required to be attempted by opposite remedies in these cases.

If

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If now we also consider the different degree of intensity, duration and place where the anguish first arises, every thing else which relates to the prognosis may be thereby discovered. For the more violent the anguish, and the longer its duration, so much the worse disorders are to be expected. For if the cause of the anxiety continues long about the extremities of the pulmonary artery, either from an imperviousness of the blood, or a spasm, as happens in a periodical asthma, there is the greatest danger of polypose concretions being formed by the blood in the large vessels and receptacles near the heart; and also of a varicose or aneurismatic dilatation of the large vessels passing out of the heart, and even of the heart itself: and from thence the most unhappy and incurable disorders would remain, even after the obstacles and anguish have been removed, as we observed before on another occasion in the comment to § 176. From what has been said, also, a reason may be given to solve the following questions.

Why anguish at last closes the tragedy almost in every disease towards the article of death?] For if we except those diseases which extinguish life in a moment, (as when the most healthy people suddenly drop down dead in the plague, as they are walking the streets without perceiving any disorder, as we mentioned before upon another occasion;) except these all other diseases towards death occasion the most severe anguish; for nothing more than this does that struggle seem to be which happens betwixt life and death in dying people. But if we consider the appearances which happen about death, the reason will be evident. For when a person is about to die, the powers of the heart are weakened, as we are taught by the pulse; and the blood cannot be propelled to the extreme parts

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parts of the body, whence ensues a paleness and coldness of the extremities : By this cold the cutaneous vessels are constringed, and thence the venal blood derived into the larger veins tends towards the right ventricle of the heart : The arteries likewise being contracted by this coldness, and being no longer distended by the blood, impelled by the now weakened powers of the heart, move their blood back again in a retrograde course towards the heart ; whence arises a great resistance to the left ventricle, which being thus unable to empty itself, therefore the pulmonary veins likewise cannot evacuate their blood into the same left ventricle ; hence the lungs will be filled full of blood, and the greatest resistance will thus arise against the right ventricle, which the dying patient endeavours to remove by the utmost efforts of respiration : But the pulmonary arteries remaining thus full, the right ventricle palpitating with a very swift motion, urges and still more distends those arteries already full, and forces out a humour thicker than usual into the air cells of the lungs, which humour the patient not being able to expectorate, fills up the trachea or wind-pipe, and its branches, and occasions that disagreeable rattling which is observable in the air vessels of the lungs, the dilatation of which by inspiration is thus more and more impeded ; hence the resistances to the right ventricle of the heart increase, 'till at length it is perfectly at rest, with the person. But it was proved at § 631, that the cause of anguish is the egress of the blood impeded from the heart ; but as this impediment takes place especially in dying people, the reason is evident why the greatest anguish always attends in the article of death. This account is confirmed by those people who have recovered, and survived after having
been

been suffocated under water, or hanged with a cord : For all of them testify that they perceived the greatest anguish, and soon after lost the sense of every thing. There was an old gardener living a few years ago, who in his flight from the enemy was hung up upon a tree, but was afterwards set at liberty by cutting the halter ; and this man has often affirmed to our author the celebrated Boërhaave, that while he was hanging he saw immediately a great light like that of lightning, and at the same time perceived an intolerable anguish, but afterwards he became insensible, and remembered nothing till he came to himself again. It is therefore not without reason that Seneca^s, having experienced the anguish of a periodical asthma, affirms, *Brevis autem valde, & procellæ similis, impetus est, intra horam ferè definit. Quis enim diu expirat? omnia corporis incommoda, aut pericula, per me transferunt : nullum mihi videtur molestius. Quid ni? aliud enim quidquid est, agrotare est : hoc est, animam agere. Itaque medici banc meditationem mortis vocant.* “ That the
 “ violence of it is very short, and like a storm
 “ terminating almost within an hour. For who
 “ can be long expiring? All the dangers and
 “ inconveniencies of body have passed through
 “ me : But none seems to me more troublesome
 “ than this. But what is more, any other kind
 “ of disorder is only being sick ; but this is the
 “ giving of up one’s soul. Therefore physicians
 “ call this the working of death.”

Why a spasmodic or nervous anguish is but little dangerous, while an inflammatory one is extremely so?] Because in the first case, when the anxiety has increased so as to bring on a fainting, the spasm which invaded, goes off while the person faints by the convulsive anguish, because the heart then

then cannot propel the blood with its due force to the encephalon, and therefore it cannot move the spirits through the nerves; whence the inordinate influx of them into certain parts will cease, and relieve the anguish. This is evident by daily observation in hysterical women, when the muscles of the gula being contracted with a cramp, retain the air in the tube of the œsophagus that was before received into it, where expanding by the heat of the parts it occasions a large tumor, and compresses all the adjacent parts with a sense as it were of immediate suffocation: For so soon as these women begin to faint, the cramp ceases, and the confined air is discharged by ructus, with a considerable noise, whereupon the whole disorder goes off. In those afflicted with a convulsive asthma there is often the same appearance; for the spasm terminating, while the patients seem to be struggling betwixt life and death, gives them an opportunity to recover; and though they suffer a hundred fits of the same nature, they always recover afterwards, unless by so frequent a repetition of the disease, polypose concretions, or a morbid dilatation should happen in the vessels next the heart, or in the heart itself, whence sudden death often ensues. What is of great service in this case in hysterical and hypochondriacal people, to whom these convulsive anxieties are so familiar, is the weaker inclination of their blood to concretion, whence there is not so much danger of polypose concretions, and the like consequences which might thence follow.

But in an inflammatory anguish the impervious blood hesitates about the extremities of the arteries, and the blood, being drove by the heart against the obstacles, expels the most fluid parts, and condenses the rest, whence the cause of the disorder is increased every moment, and death soon

soon follows, unless the inflammatory obstructing matter can be speedily dissolved, which it often cannot.

Why restlessness, tossings, &c.] The congeries of these bad symptoms seems to be expressed by Hippocrates in the single word *δυσφορία*, which denotes oppression or intolerability of the disease, as Duretus observes ^b, and which he always condemns as a fatal sign in diseases; namely, when the patient so difficultly supports the disease, that he is impatient of all manner of situations, postures, and places. On the contrary, he bids us expect every thing that is good, when the patient easily supports the disease. But even the common people have made it a constant observation, as an ill presaging sign in diseases, when the patient without any just cause insists upon changing his bed, or of lying in another place; and when such patients endeavour with restlessness of body to be continually changing their posture almost every moment, they are by an apt phrase said to be taken or seized with death. For that anxiety and continual tossings of body, with sighings and shortness of breath, denote that the blood can be no longer propelled from the right ventricle of the heart through the lungs, and therefore that suffocation and speedy death are at hand; whether the cause be an inflammatory thickness in the blood, obstructing the ends of the pulmonary artery, and rendering them impervious, or from a consumption of the lungs in suppurative diseases, in a phthisis, empyema, &c. or from such a weakness of the vital powers exhausted by force and long continuance of the disease, that they are no longer able to propel the blood through the narrow extremities of the arteries. But that continual wakefulness

^b In Coac. Hippoc. pag. 3, & 4.

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fulness must also attend at the same time is evident,
because the severe anguish totally interrupts all
sleep.

But it is to be observed, that the restless agitation
of body only, is not always a fatal sign in dis-
eases, unless a shortness of breath and sighing also
attend, which denote that the course of the blood
is impeded from the right ventricle of the heart
through the lungs. For this tossing of the body
with anguish, frequently accompanies a critical
disturbance, but without any signs that the lungs
are much overcharged. Thus anguish with wake-
fulness is by Hippocrates^l enumerated among the
signs of a future suppuration behind the ears.
Among the signs of a future hæmorrhage he
reckons sudden anguish with watchings^k. In an-
other place he says, anxiety with a pain in the
loins, brings a diarrhæa^l. But those tossings of
body which are attended with a coldness, are justly
pronounced by Hippocrates^m to be the very worst,
because then the vital actions are the most op-
pressed.

S E C T. DCXXXIV.

FROM what has been said likewise, it
is evident what different methods of
cure are required to alleviate this severe
symptom or disorder, all which methods may
yet be readily understood and put in practice,
when the nature of the symptom itself is

H h fully

^l Prorrhēt. Lib. I. Charter. Tom. VIII. pag. 802, 803. & in
Coacis Prænotion. N^o. 563. ibid. pag. 885.

^k Coac. Prænot. N^o. 113. ibid. pag. 858.

^l Coac. Prænot. N^o. 568. ibid. pag. 885.

^m Coac. Prænot. N^o. 2. ibid. pag. 853.

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fully known. When therefore the cause is discovered to be a nervous or spasmodic affection, it is removed by softening the acrid, irritating matter (§ 603, to 606.) and by expelling it by vomits, purges, sudorifics, diuretics and absterfives; by diluting with warm watery liquors, by quieting the affections of the mind, and by relaxing the fibres, vessels, and viscera (§ 36, 54, 55.) and lastly, by quieting the force of the nervous fluid with anodynes and narcotics. If it arises from an inflammatory viscid, the cure is to be attempted by resolving and diluting the fluids, and relaxing the vessels; and lastly, by restraining the impulse of the vital fluid: to these purposes chiefly conduce plentiful drinking of warm water boiled with honey and barley, slightly aromatized, or rendered subacid, with an addition of nitre; by fomentations, cataplasms, epithems, and emplasters applied to the parts affected, and composed of diluent, laxative, emollient, and anodyne substances; by clysters formed of the same ingredients injected often, and in small quantities, so as to be retained if possible; by the vapours of warm water mixed with emollient substances, and continually directed or drawn into the nose, mouth, and lungs.

Nothing has done more damage to the art of healing, than the including many distinct diseases under one general denomination, whereby the unskilful are often led into the most fatal errors. For if upon hearing the name of anguish any one
immediately

immediately thinks of a remedy, before he has first carefully found out the immediate and present cause of the anguish in the body, he can only be serviceable by accident, and will often greatly injure the patient, even though he administers the most celebrated remedies; because the same disease requires a different method of cure, according to the different causes from whence it proceeds. The strongest stimulating medicines, such as *spiritus cornu cervi*, *salis ammoniaci*, *tinctura succini*, &c. are often of the greatest use immediately given to hysterical women, when the anxiety proceeds from a nervous spasm or inordinate motion of the spirits: But the same given in an anguish proceeding from an inflammatory thickness of the blood, preventing its course through the extremities of the aorta or pulmonary artery, are truly poisons, and greatly increase the disorder. But on the other hand, profuse bleeding is one of the greatest remedies for an inflammatory anguish; whereas in hysterical women, unless they are also plethoric, a considerable loss of blood, or any other profuse evacuation would be highly injurious. Hence it is evident, that the nature of this symptom ought first to be known, according to the signs enumerated in the last preceding aphorisms, before a method of cure can be undertaken with success. Since therefore the principal difference lies betwixt the inflammatory and nervous or spasmodic cause of anguish, therefore a two-fold method of cure chiefly is required. For that difference which proceeds from the part affected, does not make any considerable alteration, unless topical remedies can be applied to the affected part: For whether the impervious blood causing the anxiety, is lodged in the extremities of the arteries, or in the ends of the *vena portarum*, the

indication will be the same, namely to dissolve the impacted matter, and open the passages: But warm watery vapours taken in by inspiration come directly into the lungs, and prove very useful, by relaxing the vessels, diluting the humours, &c. as we shall presently declare: But when the disorder is seated in the liver, fomentations applied to the hypochondria, clysters of the like kind injected, &c. are deservedly recommended.

When therefore the cause is discovered to be a nervous or spasmodic affection, &c.] It ought here to be more especially remarked, that sometimes the spasmodic cause of the anguish proceeds only from a change in the thoughts, without any thing corporeal; as when an hysterical woman only by recollecting a former affront, relapses into a paroxysm: But oftentimes there is something applied to the nerves, which are plentifully distributed thro' various parts of the body, having the property of disturbing frequently the whole nervous system, and of exciting wonderful spasms, and intolerable anguish. Thus the fragrantcy of musk, ambergrease, and civet, only by affecting the olfactory nerves, frequently excite fits: And we are even taught by observations in physic, that the nerves placed in the most remote parts of the body being injured, may disturb the whole common sensory, with all the functions thereon depending. But these wonderful effects are the most frequently observed, when the nerves distributed through the stomach and intestines, are irritated by acrid substances, or, by fordes there collected, creeping worms, &c. For an inspissate and inactive phlegm, fluctuating in the stomach, may occasion a troublesome anguish, which immediately ceases when the phlegm is discharged by vomit; and the same is frequently observed in weak people, after taking aliments of a difficult digestion. But in fevers this
anguish

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anguish arises the most frequently, when the bile rendered more than usually acrid, either before or by the fever, flows into the stomach and intestines. The troublesome anguish and restless agitation of body, which I have observed in myself, and in many others when afflicted with fevers, has been happily removed by giving a gentle vomit.

When therefore there is anguish in fevers without injuring the respiration, or without the signs of an inflammatory thickness in the blood, we ought always to think of the acrid bile, and enquire diligently whether any thing acrid or uneasy lodged in the stomach or intestines is the cause of the anguish. But in what manner the acrid irritating matter may be mitigated, has been said before under the aphorisms cited in the text. But the speediest cure of all is by expelling the acrid, offensive matter from the body, which induced the spasmodic anxiety, by irritating the nerves of the stomach and intestines. For if this acrimony lies in the stomach, it may be most commodiously removed by a vomit; but if it lies in the intestines, it is best discharged by a medicine purging downwards. But the milder vomits and purges are always most convenient in this case (of which kind are those furnished in the *Materia Medica* of our author, at the number corresponding to that of the present aphorism) to avoid increasing the fever by exciting too great a tumult. Nor yet frequently is the mass of ill humours exciting all these disorders, and lodged in these parts, any thing considerable. For Sydenhamⁿ confesses that he has often been surpris'd, when upon examining what the patient had ejected by vomit, he found the matter expelled, neither appearing considerable in quantity,

H h 3

ⁿ Sect. I. cap. 4. pag. 65.

quantity, nor endowed with any bad qualities, and yet after this discharge the sickness, anguish, restlessness or tossings, the troublesome sighings, and other bad symptoms were allayed in these fevers, so that the remaining part of the disease became easily tolerable: but when he was afraid, lest the vessels over distended with blood, should burst in the brain or lungs by the strainings to vomit, he first premised bleeding, and quieted the disturbances raised by giving a paretic medicine after the operation of the vomit or purge; and thus he found that this symptom might be safely removed in fevers. In infants, when the stomach is loaded with a mass from the curdled milk, which can neither be expelled upwards nor downwards, on account of its too great bulk, anguish is observed to follow from this cause, which the poor infant expresses by a restless agitation of body, and is frequently carried off by convulsions, excited from the same cause. In that case may be given Venice soap, ground and dissolved in the yolk of an egg, that the concremented mass may be divided, attenuated, and afterwards expelled by a gentle vomiting or purgative medicine.

It sometimes happens that this irritating cause of the anguish refuses to be expelled by these ways, but being of a much more subtle nature, it is carried off from the body by raising sweats. This Sydenham^o observed in a pestilential fever, and ingenuously confesses the error which he committed. For he had the cure of a noble lady under an ardent fever, attended with vomiting, anguish, and the other symptoms before-mentioned: in this case after bleeding, he gave a vomit, which here had not the due effect, which he had so often known in other fevers, for a diarrhœa ensued, which in
other

• Sect. II. cap. 2. pag. 153.

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other fevers he had always known prevented by a vomit; and after this, symptoms perfectly irregular succeeded, and the patient died about the fourteenth day of the disease. After this he abstained from the like practice in these fevers, and after a moderate bleeding premised, he attacked the disease with sudorific medicines, and with the most happy success, provided the sweats raised continued for twenty-four hours without interruption, constantly supplying the patient with some warm, thin drink, a little aromatized; for towards the latter part of the forementioned time, the sweat became more copious and useful by greatly relieving the patient. But if a troublesome vomiting hindered him from administering a sudorific medicine, he endeavoured to raise a sweat only by increasing the weight of bed-cloaths; and as soon as a sweat began to appear, the vomiting immediately abated, *Cum materia morbifica radii versus ambitum corporis sese exporrigerent.* "Because (as he expresses it) the morbid matter began to extend in rays from within towards the circumference of the body." Thus we learn that various methods are sometimes necessary to be taken for the expulsion of the acrid irritating matter producing the anguish; but it is evident, that the warmer kinds of sudorifics are to be avoided in fevers, for fear of too much increasing the febrile motion; or if such are given, they ought to be diluted in some thin drink, which was the practice of Sydenham. A formula or prescription of such a sudorific decoction may be seen in our author's *Materia Medica* at the number corresponding to that of the present aphorism, conformable to which likewise many others may be composed; and these are useful in all cases where it is required to dilute the humours, and relax the passages at the same time; and therefore they are

best prepared of watery liquors with mild aromatics. Vinegar diluted with six or eight times the like quantity of water, with the addition of honey or sugar till it is become palatable, and drank warm, is one of the best methods of raising sweats, since at the same time that it dilutes the blood, it powerfully resists all putrefaction. But all these liquors and sudorific medicines act likewise as diuretics under a different regimen: for if these are administered while the patient's body is well covered with bed-cloaths, they generally excite sweats; but if these are taken while the patient is exposed to an air moderately cool, they rather operate by urine; but it is also evident, that these medicines are useful at the same time by diluting and absterging.

By quieting the affections of the mind.] That the most severe anxieties may arise from violent passions of the mind, is known to every one, more especially from grief and fear. If therefore the febrile patient is one of weak nerves, or easily subject to irritation; if any thing should happen to disturb his mind, it is evident that the anguish thence arising does not proceed from the fever, or any fault in the humours not sufficiently pervious, but from a disturbance in the nervous system by the commotions of the mind, which ought therefore to be quieted. But in what manner and by what means this is to be effected, has been already explained in the comment to § 104.

By relaxing the fibres, vessels, and viscera.] For the too violent and spasmodic contraction of the fibres, and of the vessels and viscera, which they compose, impedes the free course of the humours through the vessels: if therefore those parts can be relaxed which are too much contracted, the disorder will be removed. It is indeed true, that too great a rigidity of the solid parts is not so much the offending cause, but rather a morbid contraction

tion of them by the application of acrid stimuli, or else an inordinate influx of the spirits into the moving fibres; and therefore only such things seem to be here agreeable, as remove and mitigate the irritating acrimony, or else quiet the inordinate motion of the spirits. But it is well known, that the natural contraction of the vessels, may be so much lessened by the application of relaxing medicines, that they will transmit much more grosser humours than what they were accustomed to in health; and therefore the same medicines may diminish this morbid and spasmodic constriction. Hence the antient physicians made use of soft and oily medicines for the cure of a tetanus, and rubbed the parts with the most emollient ointments; and even sometimes they immersed the whole body of the patient thus affected, into warm baths of the same kind, as we observed before upon another occasion in the comment to § 234, N^o. 3. But in what manner the fibres, vessels, and viscera may be relaxed, has been already explained in the aphorisms cited in the text.

By quieting the force of the nervous fluid with anodynes and narcotics.] How much use these are of to allay those disturbances, which have been raised by affecting the mind, has been said in the comment to § 104. See also what has been said in the comment to § 202 and 229, N^o. 2. concerning the use and efficacy of these medicines. For in all cases where there are spasmodic affections, anodynes and narcotics afford the principal remedy. When therefore there is anxiety without the signs of inflammation, recourse may be safely had to these. But how much good may be hoped for from a prudent use of these for removing anguish and other symptoms of the worst kind, has been taught us by Sydenham, who observes that he was not

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not able to alleviate the intolerable anguish in the secondary or putrid fever of the small-pox by any means, but by narcotics, and those often repeated, if this symptom was urgent; and he even remarks that many perished by this disorder, because they were destitute of these remedies. For when the variolous ichor is absorbed into the blood, it disturbs the whole, and kindles a most violent fever; whence Sydenham has observed such violent commotions of the spirits to ensue in these patients, that unless they were quieted by these remedies, death soon followed. Hence he not only ordered a narcotic medicine to be given every eight hours in the worst kind of the small-pox, but he would likewise always have a dose ready to be given, if in case the anguish and disturbance should return. But concerning these we shall treat more at large in the history of the small-pox.

If it arises from an inflammatory viscid, &c.] This is the most dangerous kind of anguish, more especially if the inflammatory viscid hesitates about the extremities of the pulmonary artery; for (as was said before at § 631,) though the obstacle which hinders the egress of the blood from the left ventricle of the heart, resides primarily about the extremities of the aorta, yet in a little time it will also extend to and obstruct the vessels of the lungs, so as to make the like obstacle or resistance to the right ventricle of the heart, whereby it will be hindered from transmitting the blood through the lungs. But if the like disorder is seated about the extremities of the vena portarum in the liver, it may give less uneasiness, though at the same time the very worst disorders may follow from it there likewise. The cure in both cases requires the inflammatory viscid to be resolved and diluted, and the vessels to be relaxed, that the impacted matter may be more easily transmitted; and

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and the cure will above all be soonest effected, if both these intentions can be answered at the same time. But by what manner, and by what medicines these intentions may be accomplished, has been already declared in the history of inflammations (§ 395 to 401), and in the general cure of fevers (§ 612 to 616). But in the mean time the greatest danger which often attends in this case, requires every remedy that is the most efficacious to be used at one and the same time. But it will be of the greatest use so to restrain the impulse of the vital fluids, that the blood may be no longer able to urge against the obstructed parts with a great force, because without this the most fluid parts only would be transmitted, and the rest would be so much the more inspissated, and drove farther into the narrow extremities of the larger vessels, whence there would be great danger of the disorder increasing, and becoming more obstinate every moment. Hence therefore a copious evacuation by bleeding will be useful, unless the extremities, being already cold, and the pulse weak and irregular, denote that only a small quantity of pervious blood is circulated through the vessels; for then the lessening of its quantity by bleeding often hastens the patient's death. To this intention also conduce the application of ligatures to the limbs, that the veins being compressed for some time, may retain the blood from returning so plentifully to the heart, so as to increase the anguish. At the same time a diluent vehicle ought to be conveyed in all forms into the blood, by the drinking of farinaceous decoctions with honey and ripe garden fruits, adding some of the mildest spices, lest the body, which is already too weak, should be oppressed by so great a quantity of diluents; but more especially here will be convenient, those

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those cooling, bitter, and milky plants, and their
juices, concerning which we spoke before in the
comment to § 614. To these may be added ni-
tre, whose great efficacy in resolving the inflam-
matory viscid is well known. At the same time
the like things are to be applied in the form of
bath, fomentation, epithem, &c. to the bibulous
veins in the external skin, more especially about
the parts affected, that the diluent and attenuant
medicines received into the veins, may by all possi-
ble ways be conveyed to the obstructions; for
thus there will be hopes of the medicines passing
to the heart, and from thence towards the ob-
structed vessels, which they may in some measure
still be able to pervade, as they are extremely thin
or subtle; and at the same time, while they pass
through, being ground and shook together with the
inflammatory viscid by the action of the vessels, in
whose smallest extremities the matter hesitates, it
will be thus partly dissolved, and by that means a
more open passage made for the blood expelled
from the heart. The same uses have also clysters
prepared of the like materials, which ought to
be often injected, and in small quantities at a
time; because if a great quantity of any liquor
is injected by the anus, it soon after raises a tenes-
mus, and is evacuated again by stool. But the in-
tention here demands liquor to be retained a long
time, that it may be drank up by the mouths of
the veins, opening into the cavity of the intestines,
and from thence pass immediately into the blood,
to be mixed with it; hence therefore if the patient
discharges the clyster immediately after it is given,
another of the same kind should be repeated with-
out delay: and in this method the patient ought
strenuously to persist in every respect, till this dan-
gerous symptom begins to be easier. Clysters will
also

also be of the most happy use, when the inflammatory viscid hesitates in the narrow extremities of the vena portarum in the liver; because what is taken up by the veins of the intestines is immediately discharged into the vena portarum, and conveyed, little or nothing changed, to the affected part. But it seems a necessary caution, that when the inflammatory matter causing the anguish is seated in the lungs, one ought not to prescribe such remedies as will take up several hours in their preparation. For a simple decoction of barley, with oxymel, nitre, juice of elder-berries, currants, and the like, which are always ready in the shops, will satisfy this urgent indication; and of the same materials clysters may be likewise formed; for so dangerous a symptom requires the most sudden relief: but in the mean time we may make use of these simple and most efficacious remedies internally, till others more operose can be prepared, if such seem to be necessary. Hippocrates^p observes, that the greatest care and strictest regimen is necessary in those fevers, which he calls (*affodes*) oppressing, accompanied with a continual tossing of the body, a distension of the hypochondria, a coldness in all the extremities, and such a restlessness that the patient cannot continue long in the same posture; but at the same time he orders them to take nothing more than oxymel with water, and in the mean time to lie down in the darkest and quietest apartment, in the softest bed, and to continue lying there for a considerable time, with as little tossing as possible, (for by motion of the body the venal blood is accelerated towards the heart, and consequently will be increased); he would likewise have linseed boiled in water and oil applied warm to the hypochondria. Hence it is evident that Hippocrates treated

^p De victu in morbis acutis. Charter. Tom. XI. pag. 145, 146.

treated this urgent disorder by a method of cure simple enough. But if all these means, carefully applied, are of little or no service, there seems to remain nothing more, but death must in a little time put a period to the anguish; that is to say, when the disorder is seated in the lungs, for in the liver it is not so soon fatal. For the most precious remedies, as to price, namely, the porcupine and oriental bezoar, &c. will here avail nothing, however much they may be recommended by some: but in the mean time, that we may not seem to neglect any thing for the sake of the rich, these or the like may be given, provided no confidence is placed in them, so as to neglect medicines much more efficacious.

But when the inflammatory viscid causing the anguish hesitates in the lungs, it will be of the greatest use to breathe in the vapours of hot water, as they are drawn immediately into the lungs: and although the principal efficacy is to be expected from the vapours of the water, yet emollient herbs are sometimes added; though the emollient virtue of plants continues in the decoction or infusion, and does not seem volatile enough to ascend together with the vapour. But such things are often added to prevent the too great simplicity of the medicine from bringing it into contempt. Thus the vapours of hot water, than which nothing relaxes more, being directly applied to the lungs, the obstructed and distended vessels, are thereby relaxed and opened, while the blood itself hesitating in the narrow extremities of the vessels is diluted. For it seems very probable, that part of the watery vapours thus applied, are not only absorbed by the bibulous veins, but also enter the small arterial ducts, which exhale a most thin dew or vapour into the air cells of the lungs. For,


as

Sect. 634. Of Anguish in FEVERS. 479

as we observed before upon another occasion (see the comment to § 393, N^o. 3.) those parts of the arteries which lie behind the obstruction, are empty, and consequently all the branches of such an artery which arise from it beyond the obstruction, will be also empty; and hence the vapour of the water may be able to enter those small branches, which open in the surface of the air-vessels, and which will draw in the vapours by the same force, as the smallest tubes draw in contiguous liquors into their cavity. When therefore a diluent and relaxing remedy is thus applied externally to the affected part, and internally, the like remedies are conveyed thither agreeable to the laws of circulation, the obstructing particles will then be attacked on both sides, and every thing will then be effected which can be reasonably expected from art, as it now stands. The celebrated author of these aphorisms knew a man who was very famous in this city of Leyden, for happily and successfully curing quinsies and inflammations of the lungs; but his method was to let the patient draw in warm vapours at the mouth by a funnel. But although he would not reveal what remedies he used, yet it was commonly known to be an infusion of certain plants in water, with the addition of a quantity of vinegar. But he made his principal cures in quinsies, by causing the mature abscess about the fauces to break sooner by these emollient vapours, towards which the concussion of these parts by coughing, excited from the vapours of the vinegar, greatly conducted.

S E C T. DCXXXV.

BUT if any where the severity of a disease earnestly calls for a speedy and safe cure, it is certainly here.



For when anguish attends in a fever, especially one that is acute and continual, and there are signs denoting that the extremities of the arteries being obstructed, hinder the egress of the blood from the heart, death is at hand, unless these impediments can be speedily removed, or at least much lessened. A physician ought therefore never to depart from a patient in this condition, without first acquainting his friends with the extreme danger, having before tried every thing whereby any relief might be expected. But altho' the like disorder gives less uneasiness when seated in the extremities of the vena portarum of the liver, yet neither is this to be slightly passed, since the very worst consequences may thence follow, and the most troublesome sense of the severe anguish requires a speedy relief. Moreover, in the nervous or spasmodic anguish, the same is likewise true, although it is the least dangerous of any of them: for if the disorder seated in the pulmonary vessels continues long, there will be reason to fear polypose concretions, with varicose or aneurismatic dilatations of the vessels next the heart, and even of the heart itself.

The end of the Fifth Volume.

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